WOLLONGONG UNIVERSITY COLLEGE HANDBOOK

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UNIVERSITY OF NEW SOUTH WALES

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Wollongong University College
Northfields Avenue
Wollongong, N.S.W. 2500
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Information in this Handbook is current at the time of publication, but may be amended without notice by the University Council.

The College

INTRODUCTION

Wollongong University College was established as a College of the University of New South Wales in 1961. It will become an autonomous university, the University of Wollongong, on 1st January, 1975. (The University of Wollongong Act, 1972, is included in the Appendix of this Handbook).

A Vice-Chancellor designate has been appointed and preparations for autonomy are underway. The expansion programme includes provisions for further buildings to be added (the layout of the College is shown on the rear inside cover of this Handbook). It is expected that seven new professorial positions will be filled in 1974.

The courses offered at present lead to undergraduate and postgraduate degrees in Applied Science, Arts, Commerce, Engineering and Science. A postgraduate diploma course in Education is offered. It is anticipated that students enrolling in 1974 will take out degrees of the University of Wollongong.

Information on the University of New South Wales Act, and the regulations and the by-laws of the University, is available in the University of New South Wales Calendar.

CALENDAR OF DATES

Session 1	March 4 to May 19
	May Recess: May 20 to May 26
	May 27 to June 16
	Midyear Recess: June 17 to July 21
Session 2	July 22 to August 25
	August Recess: August 26 to September 1
	September 2 to November 3
	Study Recess: November 4 to November 10

January

Monday 28	Australia Day—Public Holiday
Tuesday 22	Deferred examinations commence

February

Thursday 7	Deferred examinations end
	Enrolment of new students
Friday 8	Enrolment of new students
Monday 11	Enrolment of new students
Thursday 21	Enrolment of new students
Monday 25	Enrolment of re-enrolling students
Tuesday 26	Enrolment of re-enrolling students
Wednesday 27	Enrolment of re-enrolling students

March

Monday 4	Session 1 lectures commence

April

Friday 12	Easter Holidays commence
Thursday 25	Anzac Day—Public Holiday

May

Friday 3	Graduation Ceremony
Monday 20	May recess commences
Sunday 26	May recess ends

June

Monday 17	Queen's Birthday—Public Holiday
Monday 17	Mid-year recess begins
Tuesday 18	Mid-year examinations begin

July

Tuesday 2	Mid-year examinations end
Sunday 21	Mid-year recess ends
Monday 22	Session 2 lectures commence

August

Monday 26	August recess begins

September

Sunday 1	August recess ends

October

Tuesday 7	Eight Hour Day—Public Holiday

November

Sunday 10	Session 2 ends
Monday 11	Annual examinations begin

December

Tuesday 3	Annual examinations end

MEMBERS OF COLLEGE COUNCIL

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* The School of Civil, Mechanical and Mining Engineering is comprised of the Departments of Structural Engineering, Systems Engineering and Thermal Engineering.

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D. D. Diespecker, BA PhD *N'cle (N.S.W.)*, MAPsS
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TUTORS

C. G. Cupit, BA *Syd.*
J. M. Freestone, BA *N.S.W.*

THE UNION

SECRETARY/MANAGER

I. L. Dunn, LLB *Lond.*, psa, pfc

COLLEGE LIBRARY

All staff and students are encouraged to use the College Library and material can be borrowed by using a union card (student) or a library card (staff). Fines are levied for late return of books.

The Library has the responsibility of providing material for all courses in the College curriculum and carries information in books, periodicals and microforms. It has a growing reference collection and endeavours to provide for needs outside curricular and research requirements.

Stage I of the Library complex accommodates 280 readers, has photocopying facilities, a periodicals display area and a group study room. Suggestions concerning facilities and services are welcomed.

Hours of opening are usually 9 a.m.-10 p.m. Monday to Friday and 9 a.m.-5 p.m. on Saturday. Variations in hours are displayed on a notice board.

Graduates of other universities are free to use the Library, and other users, particularly qualified personnel from local commerce and industry, are welcome to use facilities available.

COLLEGE UNION

The Union, which provides opportunities for the development of social and intellectual intercourse between members, is situated at the southern boundary of the campus. It was opened in 1965 and Stage II additions were completed in 1970. The premises now comprise four common rooms and refectory plus associated offices and kitchen. A coffee bar and hot meal service is provided and there is also a Union shop. The Union building also accommodates a branch of the University Co-operative Bookshop Limited and an agency of the Commercial Bank of Australia.

Membership is compulsory for all students; staff may elect to become members. The affairs of the Union are controlled by a Board of Management and, in day to day matters, by its executive officer, the Secretary/Manager.

STUDENTS' REPRESENTATIVE COUNCIL

The Students' Representative Council is a body elected by the students to promote student welfare and interests. It provides a channel through which students can express their views and the President of the S.R.C. is an ex officio member of the College Council.

The S.R.C. organizes dances, cabarets, balls and other social functions. It also interests itself in community affairs and sponsors a number of the clubs and societies listed in the Handbook. It works in close co-operation with the University College Union and the Sports Association, but it is a distinct autonomous body.

As a constituent member of the Australian Union of Students (A.U.S.) the S.R.C. offers travel and health schemes, National U (Student Paper), and a means of keeping in touch with other universities.

"Tertangala", the Journal of the Wollongong University College Students' Representative Council is published throughout the year. Students are invited to participate in its publication and to submit items for it.

CLUBS AND SOCIETIES

All students are encouraged to participate in the activities of at least one of the various student clubs and societies. These clubs aim to promote the physical, social and educational development of students through their leisure time activities. The following clubs are recognised at this College:

Athletics
Bike Club
Commerce Society
Cricket Club
Drama Society
Engineering Society
Geological Society
Men's Hockey Club
Metallurgical Society
Outdoors Club
Overseas Students' Association
Race Relations Group
Rugby Union Club
Soccer Club
Squash Club
Table Tennis Club
Tennis Club
Trainee Teachers' Association
Wollongong Acoustic Music Society
Women's Basketball Club
Women's Hockey Club
Women's Netball
W.U.C. Christian Union
W.U.C. Film Group
W.U.C. Golf Club
W.U.C. International Rules Basketball Club
W.U.C. Soccer Club

SPORTING FACILITIES

All students pay a compulsory fee which automatically makes them members of the Sports Association. Membership is also open to employees of the College on payment of the same fee as students. Membership entitlements include the use of the recreational facilities provided by the Sports Association. Members may also join one or other of the constituent clubs of the Association at a small extra subscription. The Sports Association aims to provide physical recreation facilities of an opportunity-type for individuals or small groups. In addition, it aims to ensure that its constituent clubs are provided with adequate playing surfaces and associated equipment, that adequate funds are available to subsidise travelling, and that both clubs and individuals are encouraged to attain higher sporting standards through competition under the auspices of local associations and between Universities.

There are sports grounds on the campus including facilities for Rugby, Soccer, Hockey and Cricket Clubs. There are also two

tennis courts and financial support is given to a Squash Club, a Table Tennis Club, a Basketball Club and an Outdoors Club. The latter engages in bush walking, canoeing, camping and climbing. Extra sporting facilities costing some $140,000 are at present being planned.

CHAPLAINCY SERVICE

A Chaplaincy Service is provided within the College for the benefit of students and staff by four Christian Churches.

The Service offers fellowship, personal counselling and guidance, and leadership in biblical and doctrinal studies and in worship. The Chaplains maintain close liaison with student religious societies. The Chaplains may be contacted at their private addresses or through the College Secretary.

Anglican:	Rev. J. Mason, The Curate's Cottage, Market Street, Wollongong, 2500. Tel. 29 1167.
Methodist:	Rev. J. S. Scott, 36 Fisher Street, West Wollongong, 2500. Tel. 29 2119.
Presbyterian:	Rev. D. R. Parker, The Manse, 27 Pass Avenue, Thirroul, 2515. Tel. 67 1444.
Roman Catholic	Rev. Father T. Fox, The Presbytery, Cabbage Tree Lane, Fairy Meadow, 2519. Tel. 29 4133.

RADIO COURSES

The University's radio station, VL2UV, which broadcasts on a frequency of 1750 kHz, began operating in 1961. The University also has its own post-graduate television network, VITU, which transmits on a frequency in the u.h.f. band of 667 MHz. Domestic radios may be adapted readily to receive VL2UV. Special TV receivers are necessary to operate in the u.h.f. band, and at present it is not possible for programmes from the University television station to be received in the home. Students enrolling in radio and television courses receive printed notes which are essential for an understanding of the lectures. Seminars conducted in conjunction with these courses give students an opportunity to discuss the lectures and any difficulties they may have had with the material.

Students in Wollongong may take advantage of this service by means of tape-recorded correspondence courses, which are offered to country students at extension centres or wherever a group of students exists. The programmes are recorded on twin track 5″ reels of standard magnetic tape and can be played on most tape recorders. Over forty courses are available in this way, and in country areas, groups of as few as three students may participate at fees comparable to those paid by students in metro-

politan areas. Many enrolments have been accepted from students in other States and overseas.

The emphasis of radio courses is on postgraduate and refresher courses for professional people, in subjects ranging from Medicine and Pharmacy, to Business and Operations Research, courses in Science and Mathematics directed to secondary schoolteachers and courses to school-leaving students who are proceeding to an undergraduate course at a university.

Further information may be obtained from the Division of Postgraduate Extension Studies, University of New South Wales, P.O. Box 1, Kensington, N.S.W. 2033.

UNISEARCH LIMITED

Unisearch Ltd. was established in April, 1959, by the Council of the University for the purpose of furthering one of the major objects of the University as set out in the Act of Incorporation, viz. "to aid by research and other suitable means the advancement, development and practical application of science to industry and commerce".

Unisearch actively seeks to assist Australian industry in the solution of its research and developmental problems. It provides testing services in a wide variety of industrial fields, and is responsible for the exploitation of patents of inventions arising out of the work of the University. The Company has had considerable success in solving production problems brought to it by industrial organisations in all Australian States and in assisting in the establishment of new industrial processes.

All enquiries should be addressed to Unisearch Ltd. (Wollongong Branch), Wollongong University College, Wollongong, N.S.W. 2500. Telephone: 29 7311.

ACCOMMODATION

Assistance is given to students seeking private board and other forms of accommodation in the Wollongong area. Students requiring such assistance should make enquiries at the time of their initial enrolment or by contacting the Student Enquiries Section, First Floor, Administration Building.

INTERNATIONAL HOUSE

Warden: T. A. Lambert, ThB, PhD, JP

Dean of Students: P. B. Baynes, BA(Hons.), STL

International House is the only residential College at Wollongong affiliated with the University. It is situated between the University and the North Wollongong beaches on the Princes Highway at its junction with the Wollongong "By-Pass".

For the academic year of 1974 the College will offer accommodation for 222 graduate and undergraduate students and 10 tutors. The resident students both male and female are housed in five three-level residential blocks. Facilities include a large common room, dining room, tutorial rooms, music and television rooms, laundry, students' kiosk and a large multi purpose recreation hall for student functions, films, etc.

International House is operated as a non-denominational College by the Council of International House.

For further information, contact the Warden, International House, P.O. Box 1799, Wollongong 2500. Tel. 29 9015.

EMPLOYMENT

Information concerning casual employment is displayed on the notice board outside Student Enquiries Office and circulated to Departments.

Representatives of the Commonwealth Employment Service assist students seeking employment during the annual vacation period.

Students seeking vocational guidance and advice on career opportunities should contact the Student Enquiries Section for information on appropriate sources of advice.

COUNSELLING SERVICE

A counselling service is provided to help students and prospective students, with educational, vocational and personal problems.

For further information, contact the College Secretary.

STUDENTS' TRAVELLING CONCESSION PASSES

The various transport authorities provide fare concessions for certain classes of students.

Application forms for these concessions may be obtained from the Student Enquiries Section, First Floor, Administration Building.

Train:

(a) Periodical tickets are available during sessions to full-time students not in employment nor in receipt of any remuneration.

(b) Vacation travel concessions are available to students qualifying under (a) above.

Aircraft:

Concession fares for travel overseas, inter-state and intra-state are available under the conditions ruling for the various operating companies.

STUDENT IDENTIFICATION CARDS

All students other than miscellaneous students are issued with a Student Identification Card. This card must be carried during attendance at the College and shown on request.

The number appearing on the front of the card in the space at the top right-hand corner is the student registration number used in the College's records. This number should be quoted in all correspondence.

The card must be presented when borrowing from the College Library, when applying for travel concessions, when notifying a change of address and when applying for a special borrower's card from the libraries of the University of New South Wales, Kensington. It must also be presented when paying fees on re-enrolment each year when it will be made valid for the year and returned. Failure to present the card could result in some inconvenience in completing re-enrolment.

A student who loses his identification card must notify the College Secretary as soon as possible. Forms for this purpose are available from Student Enquiries Section, First Floor, Administration Building.

New students will be issued with Student Identification Cards as soon as possible after fee payment. In the meantime, the fees receipt form should be carried during attendance at the College and shown on request. If the identification card is not received within three weeks of fee payment the College Secretary should be notified.

LOST PROPERTY

All enquiries concerning lost property should be made to the College Office.

General Information and Regulations

GENERAL CONDUCT

Acceptance as a member of the University implies an undertaking on the part of the student to observe the regulations, by-laws and other requirements of the University, in accordance with the declaration signed at the time of the enrolment.

Smoking is not permitted during lectures, in examination rooms or in the College Library. Gambling is also forbidden.

Members of the academic staff of the College, senior administrative officers, and other persons authorised for the purpose, have authority, and it is their duty, to check and report on disorderly or improper conduct or any breach of regulations occurring in the College.

ATTENDANCE AT CLASSES

Students are expected to be regular and punctual in attendance at all classes in the course or subject in which they are enrolled. All applications for exemption from attendance at lectures or practical classes must be made in writing to the College Secretary.

In the case of illness or of absence for some other unavoidable cause a student may be excused by the College Secretary from non-attendance at classes for a period of not more than one month, or on the recommendation of the Head of the appropriate Division for any longer period.

Applications to the College Secretary for exemption from re-attendance at classes, either for lectures or practical work, may only be granted on the recommendation of the Head of the appropriate Department. The granting of an exemption from attendance does not carry with it exemption from payment of fees.

Application forms for exemption from lectures are available from the Student Enquiries Section, First Floor, Administration Building, and should be lodged there (with a medical certificate where applicable). If session examinations have been missed this fact should be noted in the application.

Where a student has failed a subject at the annual examinations in any year and re-enrols in the same course in the following year, he must include in his programme of studies for that year the subject in which he has failed. This requirement will not be applicable if the subject is not offered the following year; is not a compulsory component of a particular course; or if there is some other cause, which is acceptable to the Professorial Board, for not immediately repeating the failed subject.

Where a student has attended less than eighty per cent of the possible classes, he may be refused permission to sit for the examination in that subject.

INDEBTEDNESS TO THE UNIVERSITY

Any student who is indebted to the University and who fails to make a satisfactory settlement of his indebtedness upon receipt of due notice ceases to be entitled to membership and privileges of the University. Such student is not permitted to attend classes or examinations, or to be granted any official credentials.

In very special cases the College Secretary may grant exemption from the disqualification referred to in the preceding paragraph upon receipt of a written statement setting out all the relevant circumstances.

CHANGES IN COURSE PROGRAMMES AND WITHDRAWAL FROM SUBJECTS

Students seeking approval to substitute one subject for another, add one or more subjects to their programme or discontinue part of their programme must make application to the College Secretary on a form available from the Student Enquiries Section, First Floor, Administration Building.

Any addition or substitution of subjects after the 29th March will be accepted only with the express approval of the College Secretary on the recommendation of the appropriate Head of Department, and approval will be given in exceptional circumstances only.

In the case of students wishing to terminate their enrolment the application must be lodged at the Student Enquiries Section, First Floor, Administration Building. The College Secretary will inform students of the decision. Fees will be adjusted where necessary.

Approval of withdrawal from subjects is not automatic, each application being determined after considering the circumstances advanced as justifying withdrawal.

It is emphasized that:

(1) withdrawal from a subject, tuition in which extends over the academic year, at any time after the May recess;

(2) withdrawal from a subject, tuition in which extends over only one session, at any time after one month from the commencement of the subject; or

(3) failure to sit for the examinations in any subject in which the student has enrolled,

shall be regarded as failure to satisfy the examiners in the subject, unless written approval to withdraw without failure has been obtained from the College Secretary.

ANNUAL EXAMINATIONS

Annual examinations may take place at the end of the first or second session. Timetables showing time and place at which individual examinations will be held are posted on the central

notice boards. Mis-reading of the timetable is not an acceptable excuse for failure to attend an examination. Examination results are posted to the session addresses of students. *No results will be given by telephone.*

Examination results may be reviewed for a fee of $11 a subject which is refundable in the event of an error being discovered. Applications for review must be submitted on the appropriate form, together with the necessary fee by the date indicated on the notification of results.

In the assessment of a student's progress in University courses, consideration is given to written work, work in laboratory and class exercises, and to any sessional or other tests given throughout the year, as well as to the annual examination results.

A student who through serious illness or other cause outside his control *is unable to attend an examination* is required to bring the circumstances (supported by a medical certificate or other evidence) to the notice of the College Secretary *not later than seven days after the date of the examination.*

A student who believes that his performance *at an examination* has been affected by serious illness *during the year* or by other cause outside his control, and who desires these circumstances to be taken into consideration in determining his standing is required to bring the circumstances (supported by a medical certificate or other evidence) to the notice of the College Secretary *not later than seven days after the date of the examination.*

All medical certificates should be as specific as possible concerning the severity and duration of the complaint and its effect on the student's ability to take the examinations.

A student who attempts an examination, yet claims that his performance is prejudiced by sickness *on the day of the examination,* must notify the College Secretary or Examination Supervisor *before, during, or immediately after the examination,* and may be required to submit to medical examination.

A student suffering from a physical disability which puts him at a disadvantage in written examinations may apply to the College Secretary for special provision when examinations are taken. The student may be required to support his request with medical evidence.

Rules and Procedure for the Conduct of Examinations

(a) Candidates are required to obey any instruction given by an examination supervisor for the proper conduct of the examination.

(b) Candidates are required to be in their places in the examination room not less than ten minutes before the time for commencement.

(c) No bag, writing paper, blotting paper, manuscript or book, other than a specified aid, is to be brought into the examination room.

(d) No candidate shall be admitted to an examination after thirty minutes from the time of commencement of the examination.

(e) No candidate shall be permitted to leave the examination room before the expiry of thirty minutes from the time the examination commences.

(f) No candidate shall be re-admitted to the examination room after he has left it unless during the full period of his absence he has been under approved supervision.

(g) A candidate shall not by any improper means obtain, or endeavour to obtain, assistance in his work, give, or endeavour to give, assistance to any other candidate, or commit any breach of good order.

(h) Smoking is not permitted during the course of examinations.

(i) A candidate who commits any infringement of the rules governing examinations is liable to disqualification at the particular examination, to immediate expulsion from the examination room, and to such further penalty as may be determined in accordance with the By-Laws.

DEFERRED EXAMINATIONS

Most departments at the College do not offer deferred examinations except in medical and compassionate cases. Provision, however, exists for the award of deferred examinations in courses where progression is by subject.

TERMINATING PASSES

The award of the grade of terminating pass will prohibit a student progressing to the next subject in a sequence for which the subject in which the terminating pass is awarded, is a prerequisite.

APPLICATION FOR ADMISSION TO A DEGREE OR DIPLOMA

Applications for admission to a degree or diploma of the University must be made on the appropriate form by 11th January. Applicants should ensure that they have completed all requirements for the degree or diploma, including industrial training where necessary.

RESTRICTION UPON STUDENTS RE-ENROLLING

The University Council has adopted the following rules governing re-enrolment with the object of requiring students with a record of failure to show cause why they should be allowed to re-enrol and retain valuable class places. These rules apply retrospectively from 1st January, 1971.

(1) (i) A student shall show cause why he should be allowed to repeat a subject in which he has failed more than once. (Failure in a deferred examination as well as in the annual examination counts, for the purpose of this regulation, as one failure.) Where such subject is prescribed as a part of the student's course he shall be required to show cause why he should be allowed to continue the course.

Notwithstanding the provisions of Clause 1 (i)—

(ii) A student enrolled in the first year or first stage of any course, other than the Medical course, who has failed in more than half the programme in which he is enrolled for that year or stage shall be required to show cause why he should be allowed to continue in the course.

(iii) A student enrolled in the first year of the Medical course who has failed in more than one subject of that year shall be required to show cause why he should be allowed to continue in the Medical course.

(iv) The provisions of sections (ii) and (iii) of this rule shall be deemed to apply to any student on transfer from another course or institution whose programme of studies in the first year of enrolment immediately following transfer is comprised of subjects so chosen that half or more of such subjects are listed in the University Calendar as first year subjects.

(2) Notwithstanding the provisions of Clause (1), a student shall be required to show cause why he should be allowed to continue a course which he will not be able to complete in the time set down in the following schedule:—

Number of years in course	Total time allowed from first enrolment to completion (years)
3	5
4	6
5	8
6	9
7	11
8	12

(3) No full-time student shall, without showing cause, be permitted to continue a course unless all subjects of the first year of his course are completed by the end of his second year of attendance. No student in the Faculty of Arts shall, without showing cause, be permitted to continue a course unless he completes four subjects by the end of his second year of attendance.*

No part-time student in a course in which progression is by stage, shall, without showing cause, be permitted to continue a course in which he will not be able to complete all subjects of the first two stages by the end of his fourth year of attend-

* Different time limits apply to part-time Arts students at Wollongong University College.

ance and all subjects of the third and fourth years of his course by the end of his seventh year of attendance.

No student in the Faculty of Medicine shall, without showing cause, be permitted to continue with the Medical course unless he completes the second year of the course by the end of his third year of attendance, and the third year of the course by the end of his fourth year of attendance.

(4) A student who has a record of failure in a course at another University shall be required to show cause why he should be admitted to this University. A student admitted to a course at this University following a record of failure at another University shall be required to show cause, notwithstanding any other provisions in these rules, why he should be permitted to continue in that course if he is unsuccessful in the annual examinations in his first year of attendance at this University.

(5) Any student excluded under any of the Clauses 1-3 may apply for re-admission after two academic years and such application shall be considered in the light of any evidence submitted by him.

(6) A student wishing "to show cause" under these provisions shall do so in writing to the College Secretary. Any such application shall be considered by a committee, hereinafter referred to as the College Re-enrolment Committee, authorised by the Professorial Board, to determine whether the cause shown is adequate to justify his being permitted to continue his course or re-enrol as the case may be.

(7) The Vice-Chancellor may on the recommendation of the College Re-enrolment Committee exclude from attendance in a course or courses any student who has been excluded from attendance in any other course under the rules governing re-enrolment and whose record at the University demonstrates, in the opinion of the College Re-enrolment Committee and the Vice-Chancellor, the student's lack of fitness to pursue the course nominated.

(8) A student who has failed, under the provisions of Clause (6) of these rules, to show cause acceptable to the College Re-enrolment Committee why he should be permitted to continue in his course, and who has subsequently been permitted to re-enrol in that course or to transfer to another course, shall also be required to show cause, notwithstanding any other provisions in these rules, why he should be permitted to continue in that course if he is unsuccessful in the annual examinations immediately following the first year of resumption or transfer of enrolment as the case may be.

(9) Any student who is excluded from attendance in any course or subject under the provisions of these rules may appeal to an Appeal Committee constituted by Council for this purpose. The decision of the Appeal Committee shall be final.

(10) The notification to any student of a decision by the College Re-enrolment Committee to exclude the student from attendance in any course or subject shall indicate that the student may appeal against the decision to an Appeal Committee. In lodging such appeal the student shall ensure that a complete statement is furnished of all grounds on which the appeal is based and shall indicate whether or not the student wishes to appear in person before the Appeal Committee.

In considering an appeal the Appeal Committee, on the basis of the student's academic record and the stated grounds of appeal, shall decide:

(i) whether there are grounds which justify the Committee seeing the student in person, or

(ii) whether there is sufficient information available to the Committee to allow decision without seeing the student in person

and so proceed to determine the application accordingly.

RE-ADMISSION AFTER EXCLUSION

Applications for re-admission after exclusion must be lodged with the College Secretary not later than 30th June of the year prior to that for which re-admission is sought. An application should include evidence of appropriate study in the subjects (or equivalents) on account of which the applicant was excluded. In addition, evidence that the circumstances which were deemed to operate against satisfactory performance at the time of exclusion are no longer operative or are reduced in intensity, should be furnished. An applicant may be required to take the annual examinations in the relevant subjects as qualifying examinations in which case re-admission does not imply exemption from the subject. Late applications cannot be considered where, in the opinion of the University, insufficient time will be available for the student to prepare himself for any qualifying examinations which may be required.

It should be noted that a person under exclusion may not be enrolled in miscellaneous subjects unless he has received the approval of the College Re-Enrolment Committee.

Persons who intend applying for re-admission to the University at a future date may seek advice as to ways in which they may enhance their prospects of qualifying for re-admission. Enquiries should be made from the College Secretary.

RULES OF PROGRESSION

Progression in Full-time Courses where Progression is by the Year

1. No full-time student (except those in the Science course or in Arts, Commerce or Engineering) will be permitted to attend lectures or sit for examination in any subject in any year until he

has passed in all subjects of the previous year, unless special permission has been granted by the faculty in which he is enrolled.

2. A student who fails to qualify to progress to the next year of the course where progression is by years may be granted, by the Head of the Department conducting the course, exemption from further attendance and examination in any subject in which he has achieved a pass at a satisfactory standard. Such student may repeat those subjects required to complete the year by attendance at either day or evening classes.

3. Any student who elects to transfer to the related part-time course is not eligible to be considered for additional deferred examinations at the time of transfer and may not qualify for progression to the next year of the full-time course merely by completing the part-time equivalents of the subjects in which he has failed.

4. In general, students who fail in full-time courses, and who transfer to part-time courses, shall not be re-admitted with standing to the full-time course until they have graduated from the part-time course.

Progression in the Faculty of Engineering

Progression in all undergraduate courses in the Faculty of Engineering is now permitted by subject. However:

(1) Course programmes will continue to be stated and timetabled by year or stage and it cannot be guaranteed that non-standard programmes can be completed in the minimum number of years.

(2) Students must satisfy the rules governing re-enrolment: in particular, these require all subjects of the first year to be completed by the end of two years of full-time (or four years of part-time) study.

(3) Before enrolling in any subject a student must have satisfied the relevant prerequisite and co-requisite requirements. This will usually necessitate a student completing or attempting all subjects of a particular year or stage before proceeding to a subject in the next part of a course. Further details are available from the appropriate Department.

(4) Only in exceptional circumstances will a student be permitted to enrol in subjects extending over more than two years of the course or for more than twenty-eight hours of course work per week if a full-time student or fourteen hours per week if a part-time student. Students repeating subjects are required to choose a programme which limits their hours of course work to twenty-two per week if a full-time student, and to eleven per week if a part-time student, unless they have the express permission of the Head of the Department to exceed these hours.

(5) Notwithstanding the above, before a student can enrol in any non-standard programme, such programme must meet with the approval of the Head of Department. A non-standard programme is one which involves enrolment in subjects from more than one year or stage, or comprises subjects which do not normally constitute a particular year's course work.

Admission with Advanced Standing

Any person who makes application to register as a candidate for any degree or other award granted by the University may be admitted to the course of study leading to such degree or award with such standing on the basis of previous attainments as may be determined by the Professorial Board provided that:

(i) the Board shall not grant such standing under these rules as is inconsistent with the rules governing progression to such degree or award as are operative at the time the application is determined;

(ii) where a student transfers from another University such student shall not in general be granted standing in this University which is superior to that which he would enjoy in the University from which he transfers;

(iii) the standing granted by the Board in the case of any application based on any degree/s or other award/s already held by the applicant, shall not be such as will permit the applicant to qualify for the degree or award for which he seeks to register without completing the courses of instruction and passing the examinations in at least those subjects comprising the latter half of the course, save that where such a programme of studies would involve the applicant repeating courses of instruction in which the Board deems the applicant to have already qualified, the Board may prescribe an alternative programme of studies in lieu thereof;

(iv) the standing granted by the Board in the case of any application based on partial completion of the requirements for any degree or other award of another institution shall not be such as will permit the applicant to qualify for the degree or award for which he seeks to register by satisfactory completion of a programme of study deemed by the Board to be less than that required of a student in full-time attendance in the final year of the course in which the applicant seeks to register;

(v) the standing granted by the Board in the case of any application based on the partial completion of the requirements for any degree or other award of the University may be such as to give full credit in the course to which the applicant seeks to transfer for work done in the course from which the student transfers.

Where the identity between the requirements for any award of the University already held and that of any other award of the University is such that the requirements outstanding for the second award are less than half the requirements of that award, then a student who merely completes such outstanding requirements shall not thereby be entitled to receive the second award but shall be entitled to receive a statement over the hand of the Registrar in appropriate terms.

CHANGE OF ADDRESS

Students are requested to notify the College Secretary in writing of any change in their address as soon as possible. Failure to do this could lead to important correspondence or course information not reaching the student. The College cannot accept responsibility if official communications fail to reach a student who has not notified the College Secretary of a change of address.

OWNERSHIP OF STUDENTS' WORK

The University reserves the right to retain at its own discretion the original or one copy of any drawings, models, designs, plans and specifications, essays, theses or other work executed by students as part of their courses, or submitted for any award or competition conducted by the University.

NOTICES

Official University notices are displayed on the notice boards and students are expected to be acquainted with the contents of those announcements which concern them.

APPLICATION OF RULES

General

Any student who requires information on the application of these rules or any service which the College offers, may make enquiries from the College Secretary.

Appeals

Section 5(c) of Chapter III of the By-laws provides that "Any person affected by a decision of any member of the Professorial Board (other than the Vice-Chancellor) in respect of breach of discipline or misconduct may appeal to the Vice-Chancellor, and in the case of disciplinary action by the Vice-Chancellor, whether on appeal or otherwise, to the Council".

Undergraduate Admission and Enrolment Procedure, Fees, Scholarships and Prizes

REQUIREMENTS FOR ADMISSION

A person who seeks to become a candidate for any degree of Bachelor of the University must first have qualified for matriculation and have satisfied the requirements for admission to the particular Faculty, course or subject chosen.

In addition to complying with these conditions candidates must be selected before being permitted to enrol in a course. In 1974 it will be necessary for the University to limit the number of students enrolling in all undergraduate courses.

A candidate who has satisfied the conditions for matriculation and for admission to a course of study shall be classed as a "matriculated student" of the University, after enrolment.

A person who has satisfactorily met the conditions for admission may be provided with a statement to that effect on the payment of the prescribed fee.

All enquiries regarding admission and enrolment should be directed to the Student Enquiries Section.

Section A

GENERAL MATRICULATION AND ADMISSION REQUIREMENTS

1. A candidate may qualify for matriculation by attaining in recognised matriculation subjects at one New South Wales Higher School Certificate Examination or at one University of Sydney Matriculation Examination a level of performance determined by the Professorial Board from time to time.
2. The level of performance required to qualify for matriculation shall be
   (a) passes in at least five recognised matriculation subjects, one of which shall be English and three of which shall be at Level 2 or higher; and
   (b) the attainment of an aggregate of marks, as specified by the Professorial Board, in not more than five recognised matriculation subjects, such marks being co-ordinated in a manner approved by the Board.
3. The following subjects, and such other subjects as may be approved by the Professorial Board from time to time, shall be recognised matriculation subjects:—

English	Greek	Chinese
Mathematics	Latin	Japanese
Science	French	Hebrew
Agriculture	German	Dutch
Modern History	Italian	Art
Ancient History	Bahasa Indonesia	Music
Geography	Spanish	Industrial Arts
Economics	Russian	

4. A candidate who has qualified to matriculate in accordance with the provisions of Clauses 1, 2 and 3 may be admitted to a particular Faculty, course or subject provided that:—
   (a) his qualification includes a pass at the level indicated in the subject or subjects specified in Schedule A as Faculty, course or subject prerequisites; or
   (b) the requirements regarding these particular Faculty, course or subject prerequisites as specified in Schedule A, have been met at a separate Higher School Certificate or University of Sydney Matriculation Examination.
5. Notwithstanding any of the provisions of Clauses 1 to 4, the Professorial Board may grant matriculation status to any candidate at the Higher School Certificate or University of Sydney Matriculation Examination who has reached an acceptable standard and may admit him to any Faculty, course or subject.

NOTE:

1. For the purposes of clause 2(a), Mathematics and Science *both passed* at first level or second level full course shall together count as three subjects.
2. For the purposes of clause 2(b), Mathematics and Science *taken* either singly or together at first level or second level full course shall each count as one and one half subjects.

SCHEDULE A — PREREQUISITES

FACULTY OR COURSE	FACULTY OR COURSE PREREQUISITES
Applied Science (excl. Applied Geography, and Wool and Pastoral Sciences courses) Biological Sciences Engineering Industrial Arts course Medicine Military Studies (Engineering course and Applied Science course) Science Bachelor of Science (Education)	(a) Science at Level 2S or higher AND (b) either Mathematics at Level 2F or higher OR Mathematics at Level 2S, provided that the candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board.
Architecture Applied Geography (Biogeography and Pedology specialization) Wool and Pastoral Sciences course	(a) Science at Level 2S or higher AND (b) Mathematics at Level 2S or higher
Applied Geography (Economic Geography specialization)	Mathematics at Level 2F or higher OR Mathematics at Level 2S, provided that the candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board.
Arts	English at Level 2 or higher
Commerce	(a) Mathematics at Level 2S or higher AND (b) either English at Level 2 or higher OR English at Level 3, provided that the candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board.
Law Combined Jurisprudence/Law Combined Arts/Law Combined Commerce/Law	Nil Nil As for Arts As for Commerce

SUBJECT	SUBJECT PREREQUISITES
Military Studies (Arts course)	English at Level 2 or higher OR English at Level 3, provided that the candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board, and provided that a candidate so qualified shall not enrol in a course of English literature.
Social Work course	English at Level 2 or higher OR English at Level 3, provided that the candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board, and provided that a candidate so qualified shall not enrol in a course of English literature.
Higher Physics I* Physics I	As for Faculty of Science
Chemistry I General and Human Biology Geology I Geoscience I*	Science at Level 2S or higher
Higher Mathematics I*	Mathematics at Level 2F or higher
Mathematics I	Either Mathematics at Level 2F or higher OR Mathematics at Level 2S, provided that the candidate's performance in the subject and his general level of attainment are at standards acceptable to the Professorial Board.
Mathematics IT*	Mathematics at Level 2S or higher
Economics I (at Wollongong University College)	Mathematics at Level 2S
Economics II	As for Faculty of Commerce
English I History I	English at Level 2 or higher
French I*	French at Level 2 or higher
Russian I*	Russian at Level 2 or higher
German I*	German at Level 2 or higher
Spanish I*	Spanish at Level 2 or higher
Russian IZ* German IZ* Spanish IZ*	A foreign language, other than that in which enrolment is sought, at Level 2 or higher.

Section B

SUPPLEMENTARY PROVISIONS FOR MATRICULATION

1. Notwithstanding the provisions of Section A above, candidates may be accepted as "matriculated students" of the University under the following conditions subject to the approval of the Professorial Board:

   (a) Any person who holds a diploma from the New South Wales Department of Technical Education, or any other Technical College which may from time to time be recognised by the University, may be admitted to the University as a "matriculated student" with such status as the Board may determine, provided that, in the opinion of the Board, the applicant's qualifications are sufficient for matriculation to the Faculty nominated.

   (b) The Board may admit as a "matriculated student" in any Faculty with such status as the Board may determine in the circumstances:

      (i) A graduate of any approved University.

      (ii) An applicant who presents a certificate from a University showing that he has a satisfactory record and is qualified for entrance to that University, provided that in the opinion of the Board there is an acceptable correspondence between the qualifying conditions relied upon by the applicant and conditions laid down for matriculation to the nominated Faculty of the University of New South Wales.

   (c) (i) Any person who has completed the first year of the course at the Royal Military College of Australia and submits a certificate from the Commandant to that effect may be admitted as a "matriculated student" of the University.

      (ii) Any person who has completed a full course of at least three years' prescribed study at the Royal Military College of Australia and produces a certificate from the Commandant to that effect may be admitted as a "matriculated student" of the University with such status as the Board may determine.

   (d) Any person who has completed satisfactorily the passing out examination of the Royal Australian Naval College and submits a certificate from the Commanding Officer may be admitted as a "matriculated student" of the University.

   (e) (i) Any person who has completed the first year of the course at the Royal Australian Air Force College and submits a certificate from the Commandant to that effect, may be admitted as a "matriculated student" of the University.

(ii) Any person who has completed two years of the course at the Royal Australian Air Force College and submits a certificate from the Commandant to that effect, may be admitted as a "matriculated student" of the University with such status as the Board may determine.

(f) An applicant who presents a certificate from another University showing that he is qualified for entrance to that University and setting out the grounds of such qualification, provided that in the opinion of the Professorial Board there is an acceptable correspondence between the qualifying conditions relied upon by the applicant and the conditions laid down for matriculation to the nominated Faculty of the University of New South Wales.

2. (a) The Professorial Board may in special cases, including cases concerning persons of other than Australian education, declare any person qualified to enter a Faculty as a "provisionally matriculated student" although he has not complied with the requirements set out above, and in so doing may prescribe the completion of certain requirements before confirming the person's standing as a "matriculated student". Students who satisfactorily complete these requirements will be permitted to count the courses so passed as qualifying for degree purposes.*

(b) Persons over the age of twenty-five years may be admitted to provisional matriculation status provided that—

(i) they have satisfactorily completed an approved course of systematic study extending over at least three years after passing the School Certificate Examination, or

(ii) they satisfy the Professorial Board that they have reached a standard of education sufficient to enable them profitably to pursue the first year of the proposed course.

(c) Any applicant for provisional status may be required to take such examination as the Professorial Board may prescribe before such status is granted.

3. The Professorial Board may at its discretion permit a person, who does not satisfy the requirements for admission, to attend lectures in a subject or subjects at the University, on payment of the prescribed fees provided that such person shall not necessarily have the privileges of "matriculated students" and shall not be eligible to proceed to a degree.

* The Professorial Board has determined that normally confirmation of standing as a "matriculated student" will require the successful completion of not less than half the normal programme in the first year of enrolment.

ENROLMENT AND RE-ENROLMENT PROCEDURE

The enrolment procedure in 1974 for the different classes of undergraduate students is as follows:—

FIRST ENROLMENTS

(a) New South Wales residents already qualified for admission and persons who are applying for enrolment on the basis of qualifications gained or about to be gained outside New South Wales must lodge an application for enrolment with the Metropolitan Universities Admissions Centre, 13-15 Wentworth Avenue, Sydney (P.O. Box 7049 G.P.O., Sydney) by 26th October, 1973, for entry in 1974.

It is expected that the same timing will apply for entry in 1975; however, intending applicants should check with the Metropolitan Universities Admissions Centre.

(b) New South Wales residents qualifying for admission by the 1973 New South Wales Higher School Certificate Examination or the 1974 Sydney University Matriculation Examination and those who in 1973 have been enrolled at a University in New South Wales or the A.C.T. must apply for enrolment to the Metropolitan Universities Admissions Centre, 13-15 Wentworth Avenue, Sydney (P.O. Box 7049 G.P.O., Sydney) by 18th January, 1974, for entry in 1974.

Students whose applications for enrolment are accepted will be required to complete their enrolment at a specified time before the start of Session 1. Fees must be paid on the day specified.* However, in special circumstances and provided class places are still available students may be allowed to complete their enrolment after the prescribed date, subject to the payment of a late fee.

First year repeat students

First year students who failed more than half their programme at the 1973 Annual Examinations and who were not granted any deferred examinations will NOT follow the above procedure. They are required to "show cause" why they should be allowed to continue in the course, and should await instructions in writing from the College Secretary as to the procedure.

RE-ENROLMENTS

All students enrolling other than for the first time and not included above should re-enrol by lodging a provisional re-enrolment form by 2nd November, 1973, and attending the College to complete re-enrolment, including the payment of fees, according to the following schedule:

* Refer to NOTE on p. 40.

Arts, Commerce—Monday, 25th February, 1974.
Engineering, Metallurgy, Science—Tuesday, 26th February, 1974.

All courses (if unable to attend earlier)—Wednesday, 27th February, 1974.

Students who are unable to attend the College to complete re-enrolment on the days prescribed above should apply in writing to the College Secretary for approval to re-enrol at a later date.

Students who have completed the final examinations but have a thesis still outstanding are required to enrol for the period necessary to complete the thesis and to pay the requisite fees.

Enrolment must be completed during the prescribed enrolment period. For details of fee requirements, including late fee provisions, see under Fees.

COURSE TRANSFERS

Students who are currently enrolled at the College and who wish to transfer to another first year course (including Stages I and II of the part-time courses) at the College should apply through the Metropolitan Universities Admissions Centre in the same manner as is required of new applicants.

Students wishing to transfer to later years (i.e. excluding the year/stage referred to above) of another course at the College, should complete the "Application to Transfer Course" form which is available from the Student Enquiries Section, First Floor, Administration Building, or should make a written application to the College Secretary. Such applications for course transfers should be lodged with the College Secretary by Friday, 18th January, 1974.

Students whose applications to transfer are successful are required to comply with the enrolment procedures for the year/stage of the new course in which they expect to enrol. Unless otherwise instructed they must present the letter granting approval of the transfer to the enrolling officer.

Students who have not received advice regarding their application to transfer before the date on which they are required to enrol should check with the College Secretary.

RESUMPTION OF COURSES

Students who have been granted leave of absence for 1973 should contact the College Secretary by 18th January, 1974, for information on enrolment procedures.

All other students seeking to resume their studies after an absence of twelve months or more are required to apply for re-admission through the Metropolitan Universities Admissions Centre by 26th October, 1973.

Students re-enrolling in this way will normally be required to satisfy conditions pertaining to the course at the time of re-enrolment. This condition applies also to students who have been re-admitted to a course after exclusion under the rules restricting students re-enrolling.

MISCELLANEOUS SUBJECT ENROLMENTS

Applications from students to enrol for miscellaneous subjects (i.e. as students not proceeding to a degree or diploma) may be considered provided the Head of the Department offering the subject considers it will be of benefit to the student and there are facilities available. Only in exceptional cases will subjects taken in this way count towards a degree or diploma. Where a student is under exclusion he may not be enrolled in miscellaneous subjects unless given approval by the Professorial Board.

Application forms can be obtained by written application to the College Secretary or by collecting them personally from the Student Enquiries Section, First Floor, Administration Building. Application forms should be received by the College Secretary by 18th January, 1974.

Final Dates for Completion of Enrolment

No enrolments will be accepted from *new students* after the end of the second week of session 1 (15th March, 1974) except with the express approval of the College Secretary and the Head of the Department concerned; no *later year enrolments* will be accepted after 29th March, 1974 without the express approval of the College Secretary which will be given in exceptional circumstances only.

FEES

NOTE: The Australian Government has announced that course fees for students undertaking studies in tertiary educational institutions are to be abolished in 1974.

A. Students will not be required to meet fees and charges in the following categories:

1. Tuition fees and associated fees such as library fees.
2. Enrolment application, registration, matriculation and admission fees, including fees charged by central admission services.
3. Examination, deferred examination or graduation fees.
4. Fares and travel costs incurred in attending compulsory excursions, field work etc. but excluding those listed under B below.
5. Fees paid to hospitals by medical and dental students other than those falling within the categories listed under B below.

B. Students will continue to meet the following charges:

1. Penalty charges such as late fees, parking fines, etc.
2. Administrative charges such as "statement of record" fees, "review of result" fees or charges for examinations requiring special arrangements.
3. Cost of travel incurred by students attending practical work for courses in social work, teacher training etc.
4. Cost of travel incurred by external students attending residential schools.
5. Accommodation charges and cost of subsistence on excursions, field work etc. and for hospital residence.
6. Charges for special clothing or laundry costs.
7. Hiring charges for use of instruments or equipment.
8. Purchase of instruments or equipment.
9. Cost of handbooks and notes.
10. Charges for matriculation and other public examinations.
11. Fees and charges associated with the development and operation of unions, student associations, students' representative councils and other student activities.
12. Deposits and refundable fees.

Completion of Enrolment

All students are required to attend the appropriate enrolment centre during the prescribed enrolment period for authorisation of course programme. Failure to do so will incur a late fee of $10.

Compulsory fees should be paid during the prescribed enrolment period but will be accepted during the first two weeks of Session 1. (For late fees see below.) No student is regarded as having completed an enrolment until fees have been paid. *Fees will not be accepted (i.e. enrolment cannot be completed) from new students after the end of the second week of Session 1 (15th March, 1974), and after 30th March from students who are re-enrolling* except with the express approval of the College Secretary, which will be given in exceptional circumstances only.

Assisted Students

Scholarship holders or Sponsored Students who have not received an enrolment voucher or appropriate letter of authority from their sponsor at the time when they are enrolling should complete their enrolment paying their own fees. A refund of fees will be made when the enrolment voucher or letter of authority is subsequently lodged with the Cashier.

Extension of Time

Any student who is unable to pay fees by the due date may apply in writing to the College Secretary for an extension of time. Such application must give year or stage, whether full-time or part-time, and the course in which the applicant wishes to enrol, state clearly and fully the reasons why payment cannot be made and the extension sought, and must be lodged before the date on which a late fee becomes payable. Normally the maximum extension of time for the payment of fees is until 30th March.

Where an extension of time is granted to a first year student, such student may only attend classes on the written authority of the College Secretary, but such authority will not normally be given in relation to any course where enrolments are restricted.

Failure to Pay Fees

Any student who is indebted to the University and who fails to make a satisfactory settlement of his indebtedness upon receipt of due notice ceases to be entitled to membership and privileges of the University. Such a student is not permitted to register for

a further session, to attend classes or examinations, or to be granted any official credentials.

No student is eligible to attend the annual examinations in any subject where any portion of his fees for the year is outstanding after the end of the fourth week of Session 2.

In very special cases the College Secretary may grant exemption from the disqualification referred to in the two preceding paragraphs upon receipt of a written statement setting out all relevant circumstances.

Compulsory Fees

All registered undergraduates will be required to pay—

College Union—entrance fee $22

Sports Association—entrance fee ..... $ 6

Student Activities Fees

College Union—annual subscription $37

Sports Association—annual subscription ..... $ 6

Students' Representative Council—annual subscription ..... $ 8

Miscellaneous Fee—annual fee ..... $ 2

Depending on the course being taken, students may also be required to pay a Chemistry Kit Hiring Charge—$4 per kit. Additional charge for breakages and losses in excess of $1 may be required.

Special Examination Fees

Deferred examination—$8 for each subject.

Examinations conducted under special circumstances—$11 for each subject.

Review of examination result—$11 for each subject.

Late Fees

First Enrolments

Fees paid on the late enrolment session and before commencement of Session 1 ..... $10

Fee paid during the 1st and 2nd weeks of Session 1 ..... $20

Fees paid after the commencement of the 3rd week of Session 1 with the express approval of the College Secretary and Head of the Department concerned $40

Re-enrolments

Failure to attend enrolment centre during enrolment week $10

Fees paid after the commencement of the 3rd week of Session 1 to 30th March $20

Fees paid after 30th March where accepted with the express approval of the College Secretary $40

Withdrawal

1. Students withdrawing from a course are required to notify the College Secretary in writing. Fees for the course accrue until a written notification is received.

2. Where notice of withdrawal from a course is received by the College Secretary before the first day of Session 1 a refund of all fees paid will be made.

3. Where a student terminates for acceptable reasons a course of study within 30 days of the commencement of first session a refund of fees paid, in respect of the College Union Entrance and membership fees, the Students' Representative Council fee, the Sports Association fee, and the Miscellaneous Fee may be made as shown hereunder.

4. Where a student terminates a course of study after 30 days from the commencement of first session no refund may be made.

5. On notice of withdrawal within 30 days, a partial refund of fees is made on the following basis:

College Union—$9.25.

Students' Representative Council—$4.

Sports Association—a full refund.

Miscellaneous Fee—a full refund.

6. Where initial registration is made at commencement of second session in any year and the student subsequently withdraws, a refund of fees based on the above rules may be made.

Cashier's Hours

The Cashier's office is open for the payment of fees from 9.30 a.m. to 1 p.m., and from 2 p.m. to 4.30 p.m., Monday to Friday. The Cashier's office may be open for additional periods during the first two weeks of session. Details of these additional times may be obtained from notices posted at the College before the commencement of each session.

SCHOLARSHIPS

NOTE: The Australian Government has announced that tuition fees for students undertaking courses in tertiary educational institutions are to be abolished in 1974.

This announcement may lead to changes in many scholarship schemes which have previously been available, e.g. the Commonwealth Undergraduate Scholarship Scheme will be discontinued, and a Tertiary Allowances Scheme will be introduced.

Students are advised to check with Student Enquiries, or with the bodies offering awards for information concerning new conditions to be applied in 1974.

A separate application must be lodged for each category of scholarship listed below.

Certain scholarships and cadetships are tenable only at this College. In this category the Australian Iron and Steel Pty. Ltd. provides a number of awards.

Australian Government Assistance

A new system of Australian Government assistance for students in tertiary courses is operating from 1974. This Scheme, the Tertiary Allowance Scheme, applies to students who commence approved courses in 1974 as well as to those who commenced their courses earlier. Further information is available from the Regional Director, N.S.W. State Office, Department of Education, 59 Goulburn Street, Sydney, 2000 (Telephone: 20 929).

Mining Scholarships

The Joint Coal Board offers scholarships to male students who desire to enter the full-time degree courses in Mining Engineering and Applied Geology. The value of the scholarships ranges from $600 to $1100 per annum (including allowance for books and instruments). These scholarships will be awarded on the understanding that applicants will normally hold a Commonwealth University Scholarship which covers the cost of University fees. However, applicants without Commonwealth University Scholarships may be given consideration. While scholarship holders are not under bond it is expected that they will obtain employment in coal mining or a related industry on graduation. Applications on forms obtainable from school principals or from the Secretary, Joint Coal Board, Box 3842, G.P.O. Sydney.

C.S.R. Scholarship in Commerce

The Colonial Sugar Refining Co. Ltd. offers one scholarship each year to students enrolling in courses leading to the degree of Bachelor of Commerce specialising in Economics, Account-

ancy, Statistics, Applied Psychology or Industrial Relations. The scholarship holder will study full-time at the University during the first and fourth years of tenure; during the second and third years the scholar will be employed by the Company and enrol as a part-time student, being allowed some time off from work to attend day classes. The value of the scholarship is $1200 per annum when studying full-time, and during the years of part-time employment with the Company the holder will be paid according to the Company's basic salary scale. For details of application procedures contact the Student Enquiries Section, First Floor, Administration Building.

Manufacturers' Mutual Insurance Company Scholarship in Commerce

The Manufacturers' Mutual Insurance Company offers a scholarship each year to the value of $200 per annum. The scholarship is available to students who desire to enter or are enrolled in one of the full-time courses in the Faculty of Commerce leading to the Degree of Bachelor of Commerce and specialising in either Economics, Accountancy, Statistics, Applied Psychology or Industrial Relations. The scholarship will normally be tenable for three years but may be extended for a fourth year to allow the holder to proceed to a degree with honours. The scholarship may be held concurrently with another scholarship.

Scholarships in Electrical Engineering

The Tyree Electrical Company Pty. Ltd. provides scholarships for students enrolling in the full-time courses in Electrical Engineering. The scholarships have a value ranging from $500 to $1,500 p.a. depending on the circumstances and progress of the successful applicants. They are normally tenable for four years but may be extended to a fifth year when the holder intends to qualify for the two degrees, Bachelor of Science and Bachelor of Engineering. It may be held concurrently with any other scholarship. For details of application procedures contact the Student Enquiries Section, First Floor, Administration Building.

Regent Scholarship in Engineering for Women Undergraduates

This scholarship, which is given by Mrs. G. O'Riordan and Mrs. J. Kouvelis, has a value of $200 per annum, and will be available to a female student who wishes to enrol for the degree of Bachelor of Engineering. The scholarship will normally be tenable for four years but may be extended to five if the holder wishes to qualify for the two degrees of Bachelor of Science and Bachelor of Engineering. It may be held concurrently with any other scholarship. For details of application procedures contact the Student Enquiries Section, First Floor, Administration Building.

Ceramic Engineering Scholarships

The Brick Manufacturers' Association of New South Wales and the State Brickworks of the New South Wales Department of Public Works each offer one undergraduate scholarship in ceramic engineering. Students who have completed the first year of the course may also apply. The value of the scholarships is $900 per annum. For details of application procedures contact the Student Enquiries Section, First Floor, Administration Building.

Harbison-A.C.I. Pty. Ltd. provides a scholarship to the value of $200 per annum to students who have completed at Wollongong University College an approved programme equivalent to the first two years of the Ceramic Engineering course, and who wish to enrol in the full-time course in Ceramic Engineering. The scholarship will normally be tenable for two years. Applications should be lodged with the College Secretary within fourteen days of the notification of the results of the second year examinations at the College.

The Australasian Vitreous Enamellers' Institute offers a scholarship, valued at $250 per annum, to students entering Year 1 of the Ceramic Engineering course or who have completed Year 1 of some other programme of equivalent academic standard. The scholarship will normally be tenable for four years. For details of application procedures contact the Student Enquiries Section, First Floor, Administration Building.

The Clement Blazey Memorial Scholarships—Metallurgy

Metal Manufactures Ltd. of Port Kembla, provide the Clement Blazey Memorial Scholarships for students enrolling in the full-time course in Metallurgy leading to the Degree of Bachelor of Science. Each scholarship has a value of between $200 to $800 per annum payable to students as a living allowance. The scholarships will normally be tenable for four years. For details of application procedures contact the Student Enquiries Section, First Floor, Administration Building.

Australian Iron and Steel Pty. Ltd. Scholarships

Australian Iron and Steel Pty. Ltd. provides scholarships for students wishing to enrol in full-time degree courses in Engineering, Metallurgy, Science, Chemistry, Commerce or Economics. The scholarships are valued at $500 per annum plus allowances where applicable.

In addition to scholarships, Australian Iron and Steel Pty. Ltd. provides traineeships and cadetships in the abovementioned courses.

Applications should be lodged with Australian Iron and Steel Pty. Ltd. (P.O. Box, Wollongong, N.S.W. 2500) before the end of November in the year preceding that for which a scholarship is sought.

C.I.G.-E.M.F. Scholarships in Metallurgy

The Commonwealth Industrial Gases Limited of Sydney has undertaken to provide scholarships for students wishing to enrol in the full-time course for the B.Sc. degree in Metallurgy. Each scholarship has a value of $500 per annum and may be tenable for a maximum of four years. For details of application procedures contact the Student Enquiries Section, First Floor, Administration Building.

Conzinc Riotinto Scholarships in Metallurgy and Mining Engineering

Conzinc Riotinto provides each year two scholarships for students wishing to qualify for the Degree of Bachelor of Science in Metallurgy or Bachelor of Engineering in Mining Engineering. The scholarships are valued at $700 per annum, plus an extra $300 if the student is living away from home. Applicants may be students who have completed one year or more of an approved course. Applications should be lodged with the College Secretary within seven days of the notification of University of New South Wales examination results.

Teachers' College Scholarships

A limited number of Teachers' College Scholarships are available to allow students to undertake studies for a University degree, to be followed by a year devoted exclusively to training as a teacher. Benefits include the payment of University fees and a scholarship allowance.

Scholarship holders are expected to attend the University appropriate to the home address of their parents or legal guardian. The area appropriate to students whose training can be adequately undertaken at Wollongong University College is bounded by a line drawn through and including Helensburgh, Braidwood and Moruya.

Further information, application forms and the Teachers' College Scholarship Handbook may be obtained from the Officer-in-Charge, Teacher Training Division, Department of Education and Science, Blackfriars Street, Chippendale, N.S.W., 2006.

Bursaries Awarded by The Bursary Endowment Board

A number of bursaries tenable at the University are awarded to candidates of merit at the Higher School Certificate Examination whose family income falls within certain limits prescribed by the Bursary Endowment Board.

Applications should be made to the Secretary, Bursary Endowment Board, P.O. Box R42 Royal Exchange, N.S.W. 2000.

PRIZES

The Austin Keane Prize

Awarded to the student who most excels in the subject Applied Mathematics III.

1972 Miss W. Cairns.

The S. A. Senior Prize

Awarded to the student who most excels in the subject Pure Mathematics III.

1972 Miss W. Cairns.

The Australian Institute of Metals (Port Kembla Branch) Metallurgy Prize

Awarded each year to the graduate who has shown the best general proficiency throughout the full course.

1972 G. J. Parsons

The Peter Beckmann Memorial Prize

Awarded for meritorious performance in third year Chemistry.

1972 G. O. Langton.

The G. W. Daniels Memorial Prize

Awarded to the student who most excels in the subject Chemistry II.

1972 L. A. Vignaroli.

The Illawarra Group of the Institution of Engineers, Australia, Prizes for Engineering

(1) Awarded to the full-time, final year student proceeding to an undergraduate degree in Engineering with the best academic record.

1972 P. F. Phillips.

(2) Awarded to the part-time, final stage student proceeding to an undergraduate degree in Engineering with the best academic record.

1972 T. Donaldson.

Darryl Condon Memorial Prize

Awarded to the student proceeding to an undergraduate degree in Metallurgy who most excels in the subject Metallaurgy I.

1972 B. J. Smithers.

The Australia Institute of Mining and Metallurgy (Illawarra Branch) Geology Prize

Awarded to the student proceeding to an undergraduate degree in Science (in a Geology course) with the best academic record.

1972 G. C. Smith.

The Metallurgical Society Award

Awarded to the student who most excels in the subject Metallurgy IIA or Metallurgy II.

1972 G. J. Parsons.

The Gina Savage Prize

Awarded to the final year woman student proceeding to an undergraduate degree in Science with the best academic record.

1972 Miss W. Cairns.

The Marjory Brown Prize

Awarded to the final year woman student proceeding to an undergraduate degree in Arts with the best academic performance in fourth year English, when that course is being offered, and otherwise in third year English.

1972 Miss C. Pass.

Undergraduate Courses

FULL-TIME COURSES

Faculty	Course	Award	Duration-Years		Years offered in W'gong in 1974
			Pass	Honours	
Applied Science	Applied Geology	BSc	4	4	1
	Ceramic Engineering	BSc	4	4	2
	Chemical Engineering	BE	4	4	1
	Food Technology	BSc	4	4	1
	Industrial Chemistry	BSc	4	4	2
	Metallurgy	BSc	4	4	4
	Mining Engineering	BE	4	4	2
	Textile Technology	BSc	4	4	1
	Wool and Pastoral Sciences	BSc	4	4	1
	Wool and Pastoral Sciences (Education Option)	BSc	4	4	1
Arts	Arts	BA	3*	4	3†
Biological Sciences	Applied Psychology	BSc	4	4	1
Commerce	Accounting and Financial Management	BCom	3	4	4
	Applied Psychology	BCom	3	4	4
	Economics	BCom	3	4	4
	Economic History	BCom	3	4	1
	Industrial Relations	BCom	3	4	1
	Marketing	BCom	3	4	1
	Statistics	BCom	3	4	1
Engineering	Aeronautical Engineering	BE	4	4	2
	Civil Engineering	BE	4	4	4
	Electrical Engineering	BE/BSc	5	5	5
	Electrical Engineering	BE	4	4	4
	Industrial Engineering	BE	4	4	2
	Mechanical Engineering	BE	4	4	4
	Naval Architecture	BE	4	4	2
Medicine	Medicine	MB) BS)	6	6	1
Science	Pure and Applied Chemistry	BSc	3	4	1
	Optometry	BOptom	4	4	1
	Science (including Biological Sciences Subjects)	BSc	3	4	4
Board of Vocational Studies	Industrial Arts	BSc	4	4	1

* Not all three years of the pass course are offered in all disciplines.

† Honours courses are available in several of the Arts disciplines.

PART-TIME COURSES

Faculty	Course	Award	Duration-Years		Stages available at W'gong in 1974
			Pass	Honours	
Applied Science	Ceramics	BSc(Tech)	6	–	4
	Chemical Engineering	BSc(Tech)	6	–	3
	Food Technology	BSc(Tech)	6	–	2
	Industrial Chemistry	BSc(Tech)	6	–	4
	Metallurgy	BSc(Tech)	6	–	6
	Mining Engineering	BSc(Eng)	6	–	6
Arts	Arts	BA	5*	7	5†
Biological Sciences	Applied Psychology	BSc	6	6	2
Commerce	Accounting and Financial Management	BCom	6	7	7
	Applied Psychology	BCom	6	6	7
	Economics	BCom	6	7	7
	Economic History	BCom	6	7	2
	Industrial Relations	BCom	6	7	2
	Marketing	BCom	6	7	2
	Statistics	BCom	6	7	2
Engineering	Aeronautical Engineering	BSc(Eng)	6	–	4
	Civil Engineering	BSc(Eng)	6	–	6
	Electrical Engineering	BSc(Eng)	6	–	6
	Industrial Engineering	BSc(Eng)	6	–	4
	Mechanical Engineering	BSc(Eng)	6	–	6
	Naval Architecture	BSc(Eng)	6	–	4
Science	Pure and Applied Chemistry	BSc	6	8	2
	Science (including Biological Sciences subjects)	BSc	6	8	8
Board of Vocational Studies	Industrial Arts	BSc(Tech)	6	–	2

* Not all five stages of the pass course are offered in all of the Arts disciplines.

† Honours courses are available in several of the Arts disciplines.

OUTLINES OF COURSE REQUIREMENTS — ARTS

PROGRAMMES FOR THE DEGREE OF BACHELOR OF ARTS*

One of five different programmes may be followed by a student reading for the degree. The first is the programme for the Pass Degree which consists of nine qualifying courses studied in particular sequences over a period of three years. The second is the programme for the General Honours Degree which may be taken by a student who, having completed with merit the programme for the Pass Degree (without proceeding to graduation), studies in an additional year Course III of each of two subjects previously studied only to Course II level. The third is the programme in Special Studies, which is designed to enable a student to undertake, over a period of four years, specialized study in one subject, although a certain number of courses of subsidiary subjects must also be taken. The fourth is the programme in Combined Special Studies which is designed to enable a student to undertake, over a period of four years, specialized study in two subjects with certain subsidiary courses. The fifth is the programme for the Part-time Pass Degree which is designed to take five years.

A student who is accepted for the Special Studies or Combined Special Studies programme will be regarded as a candidate for an Honours Degree.

The Rules governing the award of the degree are set out in the following pages and consist of:

Section A — Rules 1 to 11, which are applicable to all candidates for the degree.

Section B — Rules 12 and 13, which apply specifically to the programme leading to the Pass Degree.

Section C — Rules 14 to 19, which apply specifically to the programme leading to the General Honours degree.

Section D — Rules 20 to 26, which apply specifically to the Special Studies programme.

Section E — Rules 27 to 34, which apply specifically to the Combined Special Studies programme.

Section F — Rules 35 to 37, which relate to the recognition of courses completed outside the Faculty of Arts.

Section G — Rules 38 and 39, which are Saving Clauses.

Schedule A — which sets out the subjects available for study, the qualifying courses of each subject, and other information.

Schedule B — which sets out approved sequences of courses in Mathematics and Theory of Statistics.

* Students should note that some of the courses listed in the following regulations may not be available at the College.

RULES GOVERNING THE AWARD OF THE DEGREE OF BACHELOR OF ARTS

SECTION A—Rules Applicable to all Candidates and to all Programmes of Study

1. The degree of Bachelor of Arts may be conferred as a Pass Degree or as a General Honours Degree or as an Honours Degree in Special Studies or as an Honours Degree in Combined Special Studies. There shall be three classes of Honours, namely, Class I, Class II in two Divisions and Class III.

2. No person shall be permitted to enrol in any qualifying course for the Degree of Bachelor of Arts at the same time as he is enrolled for any other degree or diploma in this University or elsewhere.

3. A person on whom the Pass Degree of Bachelor of Arts has been conferred shall not be admitted to candidature for the Honours Degree of Bachelor of Arts.

4. Where, in the following Clauses, reference is made to the requirement that a candidate shall complete a course, the requirement shall be construed as meaning that the candidate shall

(a) attend such lectures, seminars and tutorials as may be prescribed in that course;

(b) perform satisfactorily in such exercises, laboratory work, essays and thesis (if any), as may be prescribed in that course and undertake any prescribed reading relating to that course; and

(c) pass the examination or examinations in that course.

5. A candidate for the degree of Bachelor of Arts shall complete qualifying courses of subjects to the number, and in the sequences, prescribed in the following Clauses. Unless otherwise indicated, the subjects available for study, and the qualifying courses of each subject are as set out in Schedule A to these rules.

6. (a) A candidate shall pursue his studies as a full-time day student and, during his first year of study, shall enrol in at least three of the courses listed in Schedule A.*

(b) A candidate may not enrol in more than four courses in any one year.

(c) A candidate may not enrol in Course II of a subject until he has completed Course I of that subject.

(d) A candidate may not enrol in Course IIZ of a subject until he has completed Course IZ of that subject.

* Note: Faculty has determined that, for the time being, students at Wollongong University College, who are enrolled as part-time candidates for the degree need not meet the requirements of Clauses 6(a) and 12.

(e) A candidate may not enrol in Course IIIA of a subject until he has completed Course II or Course IIZ of that subject.

(f) A candidate may not enrol in Course IIIB of a subject until he has completed Course II or Course IIZ of that subject and has the approval of the Head of the School* concerned.

(g) A candidate may not enrol in Course IV of a subject until he has completed the appropriate Course IIIA or IIIB (or both) of that subject and has the approval of the Head of the School* concerned.

7. (a) *Prerequisite Courses*

A candidate may not enrol in any course listed in the left-hand column below unless he has completed the corresponding course listed as a prerequisite in the right-hand column:—

Course	*Prerequisite Course*
Mathematics II (either level)	Higher Mathematics I *or* Mathematics I
Economic History III	Economics I
Industrial Relations I	Economics I *or* Economic History I
Industrial Relations II	Economics I *or* Economics IW
Industrial Relations II (Honours)	Economics II
Physics II	Higher Mathematics I *or* Mathematics I
Psychology IIIA	Psychology II (Advanced) *or* Psychology II (Honours)
Theory of Statistics II (either level)	Higher Mathematics I *or* Mathematics I *or* Mathematics IT with a pass at credit level or better.

(b) *Co-requisite Courses*

A candidate may not enrol in any course listed in the left-hand column below unless he enrols concurrently in (or has previously completed) the corresponding course listed as a co-requisite in the right-hand column:

* At Wollongong University College, the Head of the Department.

Course	*Co-requisite Course*
Theory of Statistics III (either level)	Mathematics III (either level)

8. (a) Course I or Course IZ of a subject, when completed, shall count as one qualifying course towards the degree.

(b) Course I of a subject followed by Course II of that subject, or Course IZ of a subject followed by Course IIZ of that subject, shall be two consecutive courses of that subject. When both courses have been completed, they shall count as two qualifying courses towards the degree and shall be an approved sequence of two courses.

(c) Course I of a subject followed by Course II of that subject followed by Course IIIA or IIIB of that subject, or Course IZ of a subject followed by Course IIZ of that subject followed by Course IIIA or IIIB of that subject, shall be three consecutive courses of that subject. When the three courses have been completed, they shall count as three qualifying courses towards the degree and shall be an approved sequence of three courses.

(d) Course I of a subject followed by Course II of that subject followed by Courses IIIA and IIIB of that subject, or Course IZ of a subject followed by Course IIZ of that subject followed by Courses IIIA and IIIB of that subject, shall be a special major sequence of four courses of that subject. When the four courses have been completed, they shall count as four qualifying courses towards the degree and shall be an approved special major sequence of four courses.

9. The following courses shall be regarded as consecutive courses of a subject and, when completed, shall count as two or three, as the case may be, qualifying courses towards the degree and shall be regarded as an approved sequence of two or three, as the case may be, courses:

	First course in sequence	*Second course in sequence*	*Third course in sequence*
(a)	Higher Mathematics I *or* Mathematics I *or* Mathematics IT with a pass at Credit level or better	Theory of Statistics II	——
(b)	Theory of Statistics II	Theory of Statistics III	——
(c)	Higher Mathematics I *or* Mathematics I	Theory of Statistics II	Theory of Statistics III

10. A course may not be counted more than once for the purpose of forming an approved sequence of courses.

11. A candidate who wishes to study Mathematics or Theory of Statistics beyond the Course I level shall follow one of the approved sequences set out in Schedule B or consult the School* of Mathematics concerning alternatives.

SECTION B—Rules Relating to the Programme for the Degree of Bachelor of Arts—Pass Degree

12. A candidate shall complete over a period of not fewer than three years nor more than five years† nine qualifying courses of subjects chosen from those listed in Schedule A.

13. The nine qualifying courses so chosen shall comply with the following conditions:—

They shall consist of:

(a) an approved sequence of three courses of one subject and an approved sequence of two courses of each of three other subjects;

or

(b) an approved sequence of three courses of each of two subjects, an approved sequence of two courses of one other subject and Course I of one other subject;

or

(c) an approved sequence of three courses of each of two subjects and Course I of each of three other subjects;

or

(d) an approved special major sequence of four courses of one subject, an approved sequence of two courses of each of two other subjects and Course I of one other subject;

or

(e) an approved special major sequence of four courses of one subject, an approved sequence of three courses of one other subject and an approved sequence of two courses of one other subject;

or

(f) an approved special major sequence of four courses of one subject, an approved sequence of three courses of one other subject and Course I of each of two other subjects.

SECTION C—Rules Relating to the Programme for the Degree of Bachelor of Arts—General Honours Degree

14. A student seeking Honours shall complete eleven qualifying courses of subjects over a period of not fewer than four years nor more than five years. The eleven qualifying courses shall be

* At Wollongong University College, the Department of Mathematics should be consulted.

† Different time limits apply to part-time students.

chosen from Schedule A and shall be completed in accordance with Clauses 15 to 18.

15. (a) Nine of the eleven courses shall be completed in such a way as to fulfil the requirements for the Pass degree in accordance with Clauses 12 and 13. If the student has obtained a pass at Credit level or better in at least five of the nine courses by which he qualified for the Pass degree, he may apply to Faculty for formal recognition as a candidate for Honours.

(b) The remaining two of the eleven courses shall be completed in the Honours year and shall comprise Course IIIA or IIIB of each of two subjects of which only Courses I and II (or Courses IZ and IIZ) have so far been completed and each of these two courses shall be completed with a pass at Credit level or better.

16. A candidate in his Honours year may be required to take both the Pass and Honours syllabuses in the Course IIIA or IIIB of either or both of the two Honours year subjects. Alternatively, he may be required to take additional studies in either or both of the two Honours year subjects.

17. A student seeking recognition as a candidate for Honours, who has fulfilled the requirements for the Pass degree in accordance with Clause 13 (a), (b), (c), (e) or (f) and who has obtained a pass at Credit level or better in at least five of the nine courses so completed, may, with Faculty approval, complete Course II (or Course IIZ) of one or two (as the case may be) subjects of which only Course I (or Course IZ) has so far been completed. He may then apply to Faculty for formal recognition as a candidate for Honours and shall then proceed in accordance with the provisions of Clauses 15(b) and 16.

18. The award of Honours and grade of Honours shall be based upon a consideration of the full record of a candidate and, where Honours in any grade are awarded, they shall be listed as General Honours and not as Honours in a particular School or Schools.*

19. Where a candidate for Honours has failed to meet the necessary standards of competence in his Honours year, no further examination shall be granted but the student may proceed to graduation with a Pass Degree, the requirements for which shall already have been met.

SECTION D—Rules Relating to the Programme for the Degree of Bachelor of Arts in Special Studies—Honours Degree

20. The degree of Bachelor of Arts in Special Studies shall be awarded at Honours level only and a recognised candidate for Honours shall complete nine qualifying courses of subjects in four years of study. The nine qualifying courses, which shall include

* At Wollongong University College, there are departments instead of schools.

Course IV of the subject for Special Studies, shall be chosen from Schedule A and shall be completed in accordance with the provisions of Clauses 21 to 24. There shall be no re-examination in Course IV of the subject for Special Studies.

21. A student seeking recognition as a candidate for Honours shall choose one subject from Schedule A as his subject for Special Studies.

22. If a student obtains in his first year of study a pass at Credit level or better in Course I or Course IZ of the subject for Special Studies, he may apply to the appropriate Head of School† for formal recognition as a candidate for Honours.

23. A candidate for Honours shall complete the nine prescribed qualifying courses in accordance with the following:—

(a) Course I (or Course IZ) of the subject for Special Studies shall be completed in the first year of study; Course II (or Course IIZ) shall be completed in the second year of study; Courses IIIA and IIIB shall be completed in the third year of study; and Course IV shall be completed in the fourth year of study. Candidates shall complete Courses II (or IIZ), IIIA and IIIB in both Pass and Honours syllabuses.

(b) In addition, a candidate, by the end of his second year of study, shall be required to have completed four subsidiary courses which shall include an approved sequence of two courses.

(c) Subject to these Rules, the Head of the School* of the subject for Special Studies may prescribe the subjects of which the four subsidiary courses shall be completed as required by sub-Clause (b) of this Clause.

24. A candidate must obtain a pass at Credit level or better in the examinations of all courses of his Special Studies subject.

25. In special circumstances a candidate for the Honours degree who does not fulfil the requirements of Clauses 20 to 24 or who seeks to withdraw from the Special Studies programme may be considered by Faculty for the award of the Pass Degree of Bachelor of Arts provided that he has completed at least eight courses in the Special Studies programme (including Courses IIIA and IIIB of the subject for Special Studies) and has obtained a pass at Credit level or better in at least two of them beyond the first year level.

26. A candidate who at any stage fails to meet the necessary standards of competence and who does not fall within the provisions of Clause 25 may be required by Faculty to transfer to the programme for the Pass Degree and shall then comply with Clauses 12 and 13 to be eligible for the award of the Pass Degree. Alternatively, Faculty may prescribe an additional course or courses the completion of which shall render the student eligible for the award of the Pass Degree.

† At Wollongong University College, the Head of the Department.

SECTION E—Rules Relating to the Programme for the Degree of Bachelor of Arts in Combined Special Studies—Honours Degree

27. The degree of Bachelor of Arts in Combined Special Studies shall be awarded at the Honours level only and a recognised candidate for Honours shall complete nine qualifying courses of subjects in four years of study. The nine qualifying courses shall comprise eight of those listed in Schedule A plus a special Course IV which shall be concerned with study at an Honours level of two appropriate subjects and all nine courses, shall be completed in accordance with the provisions of Clauses 28 to 32. There shall be no re-examination in the special Course IV.

28. A student seeking recognition as a candidate for Honours shall choose as his subjects for Combined Special Studies two from Schedule A provided that the combination of subjects so chosen is approved by the Heads of the Schools* concerned.

29. If a student obtains in his first year of study a pass at Credit level or better in Course I or Course IZ of each of the subjects for Combined Special Studies, he may apply to the appropriate Heads of Schools* for formal recognition as a candidate for Honours.

30. A candidate for Honours shall complete the nine prescribed qualifying courses in accordance with the following:—

(a) Course I (or Course IZ) of each of the subjects for Combined Special Studies shall be completed in the first year of study; Course II (or Course IIZ) of each of these subjects shall be completed in the second year of study; Course IIIA (or, in any special case. Course IIIB) of each of these subjects shall be completed in the third year of study; and a special Course IV relating to these two subjects and comprising studies jointly prescribed by the Heads of the Schools* concerned shall be completed in the fourth year of study. Candidates shall complete Courses II (or IIZ) and IIIA (or IIIB) in both Pass and Honours syllabuses.

(b) In addition, a candidate by the end of his second year of study shall be required to have completed two subsidiary courses of subjects chosen from Schedule A.

(c) Subject to these Rules, the Heads of the Schools* of the subjects for Combined Special Studies may prescribe the courses specified in sub-Clause (b) of this Clause.

31. Where a Course IIIB of one of the subjects for Combined Special Studies involves a Pass as well as an Honours component, that Course may, with the approval of the Head of the School* concerned, be substituted for a Course IIIA in satisfying the relevant requirement of sub-Clause (a) of Clause 30.

32. A candidate must obtain a pass at Credit level or better in the examinations of all courses of both his subjects of Combined Special Studies and in the Special Course IV.

* At Wollongong University College, the Head of the Department.

33. In special circumstances a candidate for the Honours degree who does not fulfil the requirements of Clauses 27 to 32 or who seeks to withdraw from the Combined Special Studies programme may be considered by Faculty for the award of the Pass Degree of Bachelor of Arts provided that he has completed at least eight courses in the Combined Special Studies programme (including the Course III of each of the subjects for Combined Special Studies) and has obtained a pass at Credit level or better in at least two of them beyond the first year level.

34. A candidate who at any stage fails to meet the necessary standards of competence and who does not fall within the provisions of Clause 33 may be required by Faculty to transfer to the programme for the Pass Degree and shall then comply with Clauses 12 and 13 to be eligible for the award of the Pass Degree. Alternatively, Faculty may prescribe an additional course or courses the completion of which shall render the student eligible for the award of the Pass Degree.

SECTION F—Rules Relating to the Recognition of Courses Completed Outside the Faculty of Arts

35. Subject to the provisions of Clause 37,

(a) A graduate or undergraduate in another Faculty of this University may be granted advanced standing in a programme in the Faculty of Arts with credit for not more than four of the courses listed in Schedule A which have already been completed in the other Faculty. Where credit is granted, under these provisions, for courses forming a major sequence of three, the candidate shall be required to complete, *inter alia*, an approved sequence of three courses or an approved special major sequence of four courses in the Faculty before becoming eligible for the award of the degree.

(b) A candidate who, before enrolment in the Faculty, has completed a course or courses at another University may, at the discretion of Faculty, be granted credit towards the degree of Bachelor of Arts for not more than four such courses, provided that credit shall not be granted for Course III of a subject.

36. Subject to the provisions of Clause 37, a candidate in attendance at the University of New South Wales may, in special circumstances, be permitted by Faculty to complete concurrently at another University not more than three courses and to count such courses as partially fulfilling the requirements for the Degree, provided that permission shall not be granted to count courses which are taken externally at the other University or which are available in the University of New South Wales.

37. An applicant seeking to take advantage of any of the provisions of Clauses 35 or 36 shall first submit in writing to Faculty a statement setting out a list of the courses for which he seeks credit or which he wishes to complete at the other University, and

a list of the remaining courses that he proposes to complete within the Faculty in order to qualify for the degree. Faculty shall then determine the course or courses, if any, for which credit is to be granted or the course or courses which the applicant may complete at the other University and count towards the degree, and shall also determine the remainder of the applicant's programme within the Faculty.

SECTION G—Saving Clauses

38. Upon sufficient cause being shown, Faculty may, in a particular case or cases*, vary the requirements of any of the preceding clauses for the award of the degree of Bachelor of Arts provided that any proposed variation to Clauses 22, 23, 24, 28, 29, 30 or 32, shall be initiated by a report to the Faculty from the Head or Heads of Schools* concerned recommending the proposed variation.

39. For any student who was enrolled as a candidate in the Faculty before 1st January, 1967, Faculty may, in exceptional circumstances, determine a programme in accordance with these Rules to be followed after 1st January, 1967, in order that the student may satisfy the requirements for the degree.

* Note: Faculty has determined that, for the time being, students at Wollongong University College who are enrolled as part-time candidates for the degree need not meet the requirements of Clause 6(a).

* At Wollongong University College, the Head of the Department.

SCHEDULE A—COURSES AVAILABLE FOR BACHELOR OF ARTS

Courses qualifying for the degree of Bachelor of Arts are listed below. Subject to their availability, and class timetables permitting, these courses may be taken on either a full-time or a part-time basis.

Subject	Qualifying Course	Compulsory Hours Per Week
Chemistry	Chemistry I	6
	Chemistry II	9*
Economics†	Economics I (Arts)	6
	Economics II (Arts)	6
	Economics II (Honours Arts)	6
	Economics IIIA (Arts)	6
	Economics IIIA (Honours Arts)	9
	Economics IIIB (Arts)	6
	Economics IIIB (Honours Arts)	9
	Economics IV (Honours Arts)	8
English	English I	6
	English II	6
	English II (Honours)	9
	English III	6
	English III (Honours)	9
	English IV (Honours)	9
General Biology	General and Human Biology	6
Geography	Geography I	5
	Geography II	5
	Geography II (Honours)	6
	Geography IIIA	6
	Geography IIIB	6
	Geography IIIC	6
	Geography IIID	6
	Geography IIIA (Honours)	6
	Geography IIIB (Honours)	6
	Geography IV (Honours)	3
Geology	Geology I	6‡
	Geology II	9§
History	History I	3
	History IIA	3
	History IIA (Honours)	4
	History IIB	3
	History IIB (Honours)	4
	History IIIA	3
	History IIIA (Honours)	4
	History IIIB	3
	History IIIB (Honours)	4
History and Philosophy of Science	History and Philosophy of Science I	3
	History and Philosophy of Science II	3
	History and Philosophy of Science III	3

* Students may choose any 3 of the 4 units offered.
† For details of courses qualifying for the degree at Wollongong see page 64.
‡ Plus field tutorial(s).
§ Plus field tutorials; depending on choice of units.

Subject	Qualifying Course	Compulsory Hours Per Week
Mathematics*	Mathematics I	6
	Mathematics IIA†	6
	Mathematics IIB†	6
	Mathematics IIA (Honours)†	8
	Mathematics IIIA†	8
	Applied Mathematics IIIB†	8
	Mathematics IIIA (Honours)†	10
	Mathematics IIIB (Honours)†	9
	Mathematics IV (Honours)	10
Physics	Physics I	6
	Physics II	9
Psychology	Psychology I	6
	Psychology II	5
	Psychology II (Honours)	9
	Psychology IIIA	6
	Psychology IIIA (Honours)	6
	Psychology IIIB (Honours)	6
	Psychology IV (Honours)	4

* Students intending to proceed to Honours should consult the Head of the Department.

† These subjects to be formed from units offered to Science students subject only to the restriction of pre- and co-requisites.

SCHEDULE B—COURSE SEQUENCES IN MATHEMATICS AND THEORY OF STATISTICS

For details students should refer to the relevant section of the University of New South Wales Calendar.

OUTLINES OF COURSE REQUIREMENTS — ECONOMICS AND COMMERCE

Students planning to study Accounting and Financial Management, Applied Psychology or Economics as their major subject may enrol in the Bachelor of Commerce degree course.

Those specialising in Economics or Applied Psychology may alternatively enrol in a Bachelor of Arts degree course.

The Bachelor of Commerce course is designed for students who plan a career in industry, commerce or government. It is the basis of a wide range of careers in management, finance, research and teaching, including professional accountancy.

Students enrolled for the Bachelor of Arts degree courses may study the same subjects in Economics and Psychology as the Bachelor of Commerce students but for the Optional Commerce subjects they substitute Arts subjects.

Full-time students follow one of the programmes set out below.

Part-time students follow a programme which permits the completion of each full-time year's work, as set out below, in two stages spread over two years.

BACHELOR OF ARTS—ECONOMICS

In terms of the rules governing the award of the pass degree of Bachelor of Arts an approved sequence for the degree consists of Economics I (Arts), Economics II (Arts), Economics IIIA (Arts) and Economics IIIB (Arts). Details are shown below.

FIRST YEAR:	Economics I (Arts), *consisting of* Economics I and II, *and* Statistical Methods I (Arts), *consisting of* Statistical Methods I and II. Two other first year Arts subjects*
SECOND YEAR:	Economics II (Arts), *consisting of* Microeconomics III and IV *and* Macroeconomics III and IV Either two other second year Arts subjects, or one first year and one second year subject.*
THIRD YEAR:	Economics IIIA (Arts), *consisting of* International Economics *and* Economic Policy One other Arts subject.* *OR* Economics IIIA (Arts) *and* Economics IIIB (Arts), *consisting of* two group II Economics subjects not elsewhere included.†

BACHELOR OF COMMERCE—ECONOMICS

FIRST YEAR:	Economics I and II Accounting and Financial Management IA and IB Statistical Methods I and II Options I† and Ii†
SECOND YEAR:	Microeconomics III and IV Macroeconomics III and IV Quantitative Methods III and IV Options Iii† and IV†
THIRD YEAR:	International Economics Economic Policy Two Group II Economics Subjects (not elsewhere included)‡ Options V† and VI†

* Refer to the rules governing the award of the degree of Bachelor of Arts, page 54.

† See list of Optional Economics Subjects on the following page. Note that for B.A. candidates, subject to the approval of the Head of the Department, Quantitative Methods III and IV may be accepted in lieu of Group II subjects.

‡ Note: Here and in all other references to courses in Economics a subject requires one session and double-session Arts prescriptions are to be counted as two subjects. Two 1½ hours General Studies prescriptions count as one subject.

Choice of Options in Commerce

Options I to VI for the BCom degree with an Economics major must include two subjects selected from those offered by the Divisions of Social Science and Literature and Language (including the Department of General Studies), and two Commerce subjects unless the student elects instead to complete an approved 6 subject sequence in an Arts subject other than Economics.

The Commerce subjects included in Options I to VI may be chosen from Groups I and II below.

Optional Economics Subjects*

Group I

All subjects offered by the Divisions of Social Science and Literature and Language and all approved subjects offered by the Division of Commerce and not elsewhere included.

Mathematics I, II and III

Group II

Comparative Economic Systems
Econometrics
Economic Development
Industrial Economics
Mathematical Economics
Natural Resource Economics
Operations Research
Regional Economics
Transport Economics

HONOURS DEGREE IN ECONOMICS

Students may be admitted to the Honours degree course in either Commerce or Arts at the beginning of their third full-time session or after completing the first two subjects in Economics in a full-time or part-time course. Admission will depend on academic performance.

Bachelor of Arts Honours Degree (Economics)

Students enrolled for the BA Degree with Honours in Economics will be required to complete the sequence of subjects in Economics (including Statistics and Quantitative Methods for Economics) which is mandatory for the BCom Honours degree, but for the Economics Options and the subjects in Accountancy which are compulsory for all BCom students, they will substitute Arts subjects.

FIRST YEAR: As for the Pass degree

SECOND YEAR: Economics II Honours (Arts), *consisting of*
Microeconomics III and IV
Macroeconomics III and IV
Quantitative Methods III and IV
Two other Arts subjects

* See prerequisites for subjects in Economics and Accountancy.

THIRD YEAR: Economics IIIA Honours (Arts), *consisting of*
International Economics Honours
Economic Policy Honours
Economics IIIB Honours (Arts), *consisting of*
Three Group II Economics subjects not elsewhere included
Thesis

FOURTH YEAR: Economics IV Honours (Arts)
Advanced Economic Analysis I, II, III, IV, V, VI and completion of Thesis

Bachelor of Commerce Honours Degree

FIRST YEAR: As for the Pass Degree

SECOND YEAR: Subjects as for Pass Degree students, but with special tutorials and assignments

THIRD YEAR: International Economics Honours
Economic Policy Honours
Three Group II Economics subjects not elsewhere included
Thesis

FOURTH YEAR: Advanced Economic Analysis I, II, III, IV, V and VI and completion of thesis

Prerequisites for Courses in Economics

1. *Prerequisites for all courses in Economics:*
   H.S.C. Mathematics—Level 2S or higher
   H.S.C. English—Level 2 or higher.†

BACHELOR OF COMMERCE—ACCOUNTING AND FINANCIAL MANAGEMENT

General Description

The Department of Accountancy offers full-time and part-time courses leading to the degree of Bachelor of Commerce. These courses comprise a sequence of accounting and financial management subjects designed to provide a comprehensive understanding of the conceptual basis of accounting and the application of these ideas to the provision of management information systems and to the financial management and accountability of business and public enterprises. Concurrent studies in law provide a broad introduction to the legal environment of business. Required courses in economics, statistics and general studies are also included in the degree structure. A range of electives provides the opportunity to develop special areas of interest in

† English at Level 3 is acceptable in cases in which the candidate's performance in this subject and his general level of attainment are at standards acceptable to the Professorial Board.

accounting and associated fields, including more advanced treatment of computer applications in business. Throughout the courses the emphasis is upon mastery of ideas and stimulation of critical ability, to provide a foundation for personal and professional development. The course provides an appropriate preparation for entry into the accountancy profession, but the scope and orientation are much broader than for this purpose alone, and the course provides a particularly suitable education for careers in business and administration.

Students with a good academic record are encouraged to enter the honours course after completion of the second year full-time, or at the equivalent stage part-time. This course, using seminar discussion, provides a more extensive exposure to recent developments in accounting thought and practice. Enrolments require approval of the Head of Department.

The honours course will be commenced at third year level in 1974, and the fourth year will be introduced in 1975.

Selection of Electives or Options

The structure of the degree permits students to choose options relevant to their course objectives, and thus complement their study of accounting and financial management and related subjects, with subjects chosen from other disciplines, especially Economics, Mathematics and Psychology. For example, students who included Psychology I in their degree course may be permitted to choose papers from Psychology II, and which are relevant to Industrial Psychology. These papers could be usefully combined with the subjects Industrial Economics and Industrial Law.

Part-Time Study

Part-time students normally take two subjects a session. The following subjects are recommended as appropriate for the first two years of part-time study:

	Session I	*Session II*
Year 1 (Part-time)	Accounting & Financial Management IA	Accounting & Financial Management IB
	Economics I	Economics II
Year 2 (Part-time)	Statistical Methods I	Statistical Methods II
	Law in Society	Option I

Requirements for Degree

To complete the requirements for the Pass degree specialising in Accounting and Financial Management, a candidate shall pass the subjects as set out below:—

BACHELOR OF COMMERCE—PASS DEGREE—FULL TIME COURSE IN ACCOUNTING AND FINANCIAL MANAGEMENT

		Hours per week for one session*
	YEAR I	
Session 1:	Accounting and Financial Management IA	4
	Economics I	3
	Statistical Methods I	3
	Law in Society	3
Session 2:	Accounting and Financial Management IB	4
	Economics II	3
	Statistical Methods II	3
	Option I	3
	YEAR II	
Session 1:	Accounting and Financial Management IIA	4
	Microeconomics III	3
	Information Systems	3
	Option II	3
Session 2:	Accounting and Financial Management IIB	4
	Macroeconomics III	3
	Business Finance	3
	Option III	3
	YEAR III	
Session 1:	Accounting and Financial Management IIIA	4
	Option IV	3
	Option V	3
Session 2:	Accounting and Financial Management IIIB	4
	Option VI	3
	Option VII	3

Options

Candidates shall choose Options in accordance with the following provisions:—

(i) *At least two Options* shall be chosen from:—

Advanced Auditing
Advanced Business Finance
Advanced Information Systems
Business Law I
Business Law II
Business Organization and Policy
Industrial Law
Taxation Law

Options in this group will be available in any year subject to sufficient enrolments and the availability of staff.

* Laboratory sessions, as required, are additional to the prescribed hours.

(ii) *Two Options* shall be selected from subjects, other than economics subjects, which are either:—

(a) offered by the Department of General Studies, in which case two one-session units are counted as one Option, or

(b) qualifying subjects for the degree of Bachelor of Arts. Where an Arts subject is of at least three hours' class contact per week studied for a whole year it shall count as two Options.

A subject taught by the Department of General Studies and the corresponding Arts subject may not both be counted towards the requirements for the degree, and no more than four units taught by the Department of General Studies may be counted towards the requirements for the degree.

(iii) Subject to provisions (i) and (ii) above, Options may also be chosen from any *approved* subjects taught in the University which require at least 1½ hours of class contact for two sessions or 3 hours of class contact for a session. Requests for the approval of subjects to count as Options should be directed to the Head of the Department of Accountancy. Apart from service courses for other Divisions, *all subjects offered by the Division of Commerce will be automatically approved*, save that no subject can be counted both as an Option and as a prescribed subject. (Where an Arts subject is of at least three hours' class contact per week studied for a whole year it shall count as two Options.)

Prerequisite Subjects

A candidate may not enrol in any subject listed in the left hand column below unless he has passed the corresponding subject listed as a prerequisite in the right hand column.

Subject	*Prerequisite*
Accounting & Financial Management IB	Accounting & Financial Management IA
Accounting & Financial Management IIA	Accounting & Financial Management IB
Accounting & Financial Management IIB	Accounting & Financial Management IB
Accounting & Financial Management IIIA	Accounting & Financial Management IIB
Accounting & Financial Management IIIB	Accounting & Financial Management IIA
Business Law I	Law in Society
Business Law II	Business Law I
Advanced Auditing	Accounting & Financial Management IIB
Advanced Business Finance	Business Finance
Taxation Law	Business Law i
Industrial Law	Law in Society
Advanced Information Systems	Information Systems
Business Organisation and Policy	Accounting and Financial Management IIA

In exceptional circumstances the above requirements may be varied. Requests for variation should be directed to the Head of the Department of Accountancy.

For subjects offered by Departments other than the Department of Accountancy, subject prerequisites and rules of progression as prescribed by those Departments apply.

HONOURS DEGREE IN ACCOUNTING AND FINANCIAL MANAGEMENT

FIRST AND SECOND YEAR

As for the Pass degree

THIRD YEAR

As for the Pass degree *plus*
Accounting and Financial Management III (Honours) (Full year)

FOURTH YEAR

Session 1: Accounting Theory
Current Developments in Accounting Thought—Financial
Current Developments in Accounting Thought—Managerial

Session 2: Honours Option I
Honours Option II
Research Essay

A weekly seminar of not less than two hours will be held for each subject.

Research Essay

The rules relating to the presentation of theses for the pass and honours degree in Commerce, also apply to the research essay, which is to be submitted by 1 November of the year in which a student enrolls in it. In exceptional circumstances this period may be extended to the following 28 February by the Head of Department.

Professional Recognition of Accountancy Courses

The extent of recognition of the revised Commerce degree courses in Accountancy by professional organizations has yet to be determined, but it is expected to be similar to that accorded the old course. Arrangements for recognition in respect of the old course are as set out below:—

The Australian Society of Accountants has accepted this University as an approved tertiary institution for the purpose of the Society's qualifying examination. Graduates who complete the Commerce (Accountancy) course including the subjects Auditing and Internal Control, Taxation Law and Practice, and Commercial Law II are exempted from the whole of the qualifying

examination. Graduates completing this degree without these specified electives are required to pass a paper corresponding to each of those areas not covered by the degree course undertaken.

The Institute of Chartered Accountants in Australia will accept a graduate completing the Accountancy course for the Bachelor of Commerce degree as eligible, under the Institute's new admission requirements, to enter the "Institute year" leading to membership, provided he includes in his course the optional subjects Taxation Law and Practice and Commercial Law II.

The Public Accountants' Registration Board of New South Wales will exempt from its examinations graduates who complete the Commerce (Accountancy) course provided they include in their course the optional subjects Auditing and Internal Control, Taxation Law and Practice, and Commercial Law II.

The Institute of Chartered Secretaries and Administrators grants the maximum recognition permitted by its regulations: a graduate completing the Accountancy course for the degree of Bachelor of Commerce will be granted exemptions from eight of the thirteen subjects prescribed in the Institute's examination syllabus, provided he includes in his course the optional subjects Auditing and Internal Control, Taxation Law and Practice, and Commercial Law II.

Applications for registration, exemption or admission should be made direct to the professional bodies concerned.

BACHELOR OF COMMERCE—APPLIED PSYCHOLOGY

The Commerce course offering specialization in Applied Psychology is designed to provide training in Economics, together with a theoretical training in individual and group psychology and an introduction to the skills and techniques of psychological assessment and data collection and analysis. The first subject in Psychology is aimed at giving the student a foundation of psychological theory and an appreciation of the application of scientific method to the social sciences. In later years of the course detailed study is made of personality development, psychological assessment and measurement techniques. Opportunity is given for special study of some selected areas of psychology such as social psychology, motivation, human factors in engineering, learning and psychometrics and counselling theory and techniques. Students are encouraged to undertake field work which can involve work in industrial settings.

YEAR 1: Psychology I (2 sessions)
Accounting and Financial Management IA and IB
Economics I and II
Options I and II

YEAR 2: Psychology II (2 sessions)
Macroeconomics III and IV
Microeconomics III and IV
Options III and IV

YEAR 3: Psychology III (2 sessions)
International Economics
Economic Policy
Options V and VI

Note: The selection of Options, is subject to the same provisions as those set out above for the Economics major.

It is possible for BCom students to take Honours in Psychology. Students gaining a credit in Psychology I and desiring to take Honours should consult with the Heads of the two Departments. Their second and third year requirements in Psychology are as specified for Arts Honours students.

Details of Psychology I, II and III are set out below:—

PSYCHOLOGY I	**Offered In Session**	**Hours per week**
Motivation, Development & Adjustment	1	3
Psychological Measurement I	1	3
Psychobiology	2	3
Laboratory Method I	2	3
PSYCHOLOGY II		
Personality Theory	1	2
Psychological Measurement	1	2
Research Design	1	2
Learning Theory	2	2
Psychological Testing	2	2
Laboratory Method II	Full Year	2
Developmental Psychology	2	2
PSYCHOLOGY III		
IIIAi Psychological Theory	1	2
IIIAi Social Psychology	1	2
IIIAi Educational Psychology	1	2
IIIAii Advanced Psychological Theory	2	2
IIIAii Counselling Psychology	2	2
IIIAii Experimental Psychology	2	2

Theses for Pass and Honours Degrees

Each student enrolled for an honours degree in the Division of Commerce must present a thesis in his final year of study. Subject to the approval of the Head of Division, pass students majoring in Economics may present a thesis as an advanced Economics Option. Approval will depend on the student's record and his research plan.

BCom Students enrolled for Honours in Psychology will be required to do a Research Seminar (involving the presentation of

an empirical and a theoretical thesis), a Significant Developments in Psychology Seminar, and an Applications and Current Issues in Psychology Seminar. Details of the requirements are as set out for Arts Honours courses in Psychology.

The topic of the thesis is to be selected by the student and submitted to the Head of the Division for approval. The Head of Division will nominate a member of staff as supervisor for each student writing a thesis.

The length of a thesis submitted for the pass degree should not exceed 6000 words, or 10,000 words for the honours degree.

In writing a thesis, students must pay special attention to matters of presentation. They are advised to consult Kate L. Turabian, *A Manual for Writers of Term Papers, Theses and Dissertations,* Phoenix Books, University of Chicago Press, 3rd ed., 1967.

The thesis must include a bibliography and an acknowledgement of all source material and be accompanied by an abstract of approximately 200 words. Two copies of the thesis, in double-spaced typescript on quarto paper, with a 1-inch left-hand margin, and suitably bound or stapled, must be submitted.

Note: Students who propose to write a thesis for submission as a Group II option for a Pass degree in Economics must submit topics by the end of September in the previous year.

OUTLINES OF COURSE REQUIREMENTS — ENGINEERING

The Engineering Departments offer full-time courses of 4 years' duration and part-time courses of 6 years' duration leading to the professional degrees of Bachelor of Engineering and Bachelor of Science (Engineering). These degrees are recognised by the Institution of Engineers, Australia, as giving complete exemption from the examinations required for admission to the grade of Member. Recognition by overseas engineering institutions varies in the different branches of engineering, but in most cases, substantial or complete recognition is accorded to these courses.

The first year of the full-time course is common to all courses and is equivalent to the first two stages of the part-time course, making it possible for students to transfer from one course to another at the end of their first year or second stage without loss of standing. Provision is made for direct transfer to or from corresponding courses at Kensington at the end of the first or second year.

A student completing the BSc(Eng.) degree course and wishing to qualify for the corresponding BE degree may transfer, providing he does not take out the BSc(Eng.) degree.

All course transfers are subject to the approval of the Head of the appropriate School or Department.

Courses leading to the BSc(Eng.) award are basically part-time and require the prescribed industrial experience to be gained concurrently with the course of study (a minimum of three years of suitable engineering experience is required). Students transferring from full-time courses must, therefore, also satisfy these industrial experience requirements before being admitted to the degree of BSc(Eng.).

SCHOOL OF CIVIL, MECHANICAL AND MINING ENGINEERING

The School provides two full-time and three part-time undergraduate courses leading to the award of professional degrees.

The full-time BE courses are offered in Civil Engineering and in Mechanical Engineering. The part-time BSc(Eng.) courses are offered in Civil Engineering, Mechanical Engineering and Mining Engineering. In addition, the first two years of the full-time BE course in Mining Engineering are offered, following which students must transfer to Kensington for completion of the course. The first two years of the Civil and Mechanical Engineering courses are acceptable for transfer to courses at Kensington in Aeronautical Engineering, Civil Engineering, Industrial Engineering, Mechanical Engineering and Naval Architecture.

The School also offers a formal postgraduate course leading to the degree of Master of Engineering Science in Mechanical Engineering in addition to research degrees leading to Master of Engineering and Doctor of Philosophy. Details of these appear under Postgraduate Study in this Handbook.

The first two years of the full-time courses are identical in course content with the first four stages of the part-time courses. Either degree may be taken out by a continuation of full-time/part-time study, subject to approval by the Head of School.

Industrial experience is an integral part of the full-time course. Twelve weeks of industrial training must be completed by Civil Engineering and Mechanical Engineering students between Years 3 and 4. All students are strongly recommended to gain as much industrial training as possible in other long vacations.

Assessment

A student's performance in a course will be based on a grade point system. Final grades in each engineering subject will be listed as A, B, C, D or E where A = highest, B = above average, C = average, D = lowest passing grade, E = failure.

An A pass will count as 4 points for each credit hour of content (e.g. an A in a 3 credit hour subject will count as 12 grade points), a B will count as 3 points, C as 2 points, D as 1 point and

E as 0 points. Students receiving a grade of E must repeat the subject for credit.

A scholarship index or grade point average is obtained by dividing the total number of grade points obtained by the number of credit hours taken. A minimum of 2.0 corresponding to a "C" average is required for graduation. Students with less than 2.0 in the early years or stages of their course will be on probation and may be excluded from the course.

CIVIL ENGINEERING—FULL TIME COURSE

BACHELOR OF ENGINEERING

YEAR I

SESSION I	Hours per session			SESSION II	Hours per session		
	Lect.	Tut., Drg.	Lab., Off.		Lect.	Tut., Drg.	Lab., Off.
Applied Mechanics I	56		28	Design I	56		28
Mathematics I	56		28	Mathematics I	56		28
Physics I	42		42	Physics I	42		42
Chemistry IA	28		56	Materials I	28		56

YEAR II

Mathematics II	56		14	Mathematics II	56	14
Fluid Mechanics I	28		14	Materials II	28	14
Applied Elec. I	28		14	Applied Elec. I	28	14
Strength of Materials	28		14	Design II	20	36
Thermodynamics I	28		14	Exper. Engg. I	12	30
Applied Mechanics II	28		14	Applied Mechanics III	28	14
General Studies	28		14	General Studies	28	14

YEAR III

Applied Mechanics IV	28		14	Applied Mechanics V	28	14
Surveying I	28		14	Surveying II	21	21
Design III	20		36	Design IV	20	36
Structures I	36		20	Heat Transfer	28	14
Soil Mechanics I	28		14	Materials III	28	14
Fluid Mechanics II	28		14	Fluid Mechanics III	28	14
General Studies	28		14	Survey Camp*	—	—
				General Studies	28	14

* A one-week Survey Camp will be held during the recess between Sessions I and II.

YEAR IV

Thesis	—		84	Thesis	—	84
Systems Analysis I	28		14	Systems Analysis II	28	14
Engg. Management I	28		—	Engg. Management II	28	—

Plus at least 15 hours of electives selected from the following (subject to the approval of the Head of School)

SESSION I	Hours per session		SESSION II	Hours per session	
	Lect.	Tut., Lab., Drg. Off.		Lect.	Tut., Lab., Drg. Off.
Roads Engineering	42	14	Soil Mechanics II	28	28
Materials IV	42	14	Public Health Engg.	42	14
Structures II	28	14	Structures III	28	14
Systems Analysis III	28	14	Geology for Engrs.	28	14
Thermodynamics II	28	14	Exper. Engg. II	10	46
Materials Handling Systems I	28	14			

MECHANICAL ENGINEERING—FULL TIME COURSE

BACHELOR OF ENGINEERING

YEAR I

Applied Mechanics I	56	28	Design I	56	28
Mathematics I	56	28	Mathematics I	56	28
Physics I	42	42	Physics I	42	42
Chemistry IA	28	56	Materials I	28	56

YEAR II

Mathematics II	56	14	Mathematics II	56	14
Fluid Mechanics I	28	14	Materials II	28	14
Applied Elec. I	28	14	Applied Elec. I	28	14
Strength of Materials	28	14	Design II	20	36
Thermodynamics I	28	14	Exper. Engg. I	12	30
Applied Mechanics II	28	14	Applied Mechanics III	28	14
General Studies	28	14	General Studies	28	14

YEAR III

Thermodynamics II	28	14	Heat Transfer	28	14
Control Systems I	28	14	Control Systems II	28	14
Design III	20	36	Design IV	20	36
Applied Mechanics IV	28	14	Applied Mechanics V	28	14
Fluid Mechanics II	28	14	Fluid Mechanics III	28	14
Structures I	36	20	Exper. Engg. II	10	46
General Studies	28	14	General Studies	28	14

YEAR IV

Thesis	—	84	Thesis	—	84
Systems Analysis I	28	14	Systems Analysis II	28	14
Engg. Management I	28	—	Engg. Management II	28	—

Plus at least 15 hours of electives selected from the following (subject to the approval of the Head of School)

SESSION I	Hours per session		SESSION II	Hours per session	
	Lect.	Tut., Lab., Drg. Off.		Lect.	Tut., Lab., Drg. Off.
Thermodynamics III	28	14	Fluid Mechanics IV	28	14
Applied Dynamics I	28	14	Applied Dynamics II	28	14
Structures II	28	14	Structures III	28	14
Nuclear Power Technology I	28	14	Nuclear Power Technology II	28	14
Systems Analysis III	28	14	Materials III	28	14
Applied Elec. II	28	14	Applied Elec. II	28	14
Materials Handling Systems I	28	14	Materials Handling Systems II	28	14

MINING ENGINEERING—FULL TIME COURSE

BACHELOR OF ENGINEERING

YEAR I

Applied Mechanics I	56	28	Design I	56	28
Mathematics I	56	28	Mathematics I	56	28
Physics I	42	42	Physics I	42	42
Chemistry IA	28	56	Chemistry IB	28	56

YEAR II

For details of the second year programme contact School of Civil, Mechanical and Mining Engineering.

YEARS III AND IV

The third and fourth years of the BE(Mining Engineering) course must be completed at Kensington.

CIVIL, MECHANICAL AND MINING ENGINEERING—PART TIME COURSE

BACHELOR OF SCIENCE (ENGINEERING)

STAGE I

SESSION I	Hours per session		SESSION II	Hours per session	
	Lect.	Tut., Lab., Drg. Off.		Lect.	Tut., Lab., Drg. Off.
Mathematics I	56	28	Mathematics I	56	28
Applied Mechanics I	56	28	Design I	56	28

STAGE II

Chemistry IA	28	56	Materials I *or* Chemistry IB*	28	56
Physics I	42	42	Physics I	42	42

* Chemistry IB to be taken by Mining Engineering students only.

STAGE III

SESSION II	Hours per session Lect.	Tut., Drg.	Lab., Off.	SESSION I	Hours per session Lect.	Tut., Drg.	Lab., Off.
Mathematics II	56		14	Mathematics II	56		14
Applied Mechanics II	28		14	Applied Mechanics III	28		14
Strength of Materials	28		14	Design II	20		36

STAGE IV

Fluid Mechanics I	28		14	Materials II*	28	14
Thermodynamics I	28		14	Exper. Engg. I	12	30
Applied Elec. I	28		14	Applied Elec. I	28	14
General Studies	28		14	General Studies	28	14

* Geology for Engineers may be substituted for this subject by Mining Engineers.

CIVIL ENGINEERING

STAGE V

SESSION I				SESSION II			
Fluid Mechanics II	28		14	Fluid Mechanics III	28		14
Surveying I	28		14	Surveying II	21		21
Structures I	36		20	Materials III	28		14
Soil Mechanics I	28		14	General Studies	28		14
				Survey Camp*			

* A one-week Survey Camp will be held during the recess between Sessions I and II.

STAGE VI

Design III	20		36	Design IV	20	36

Plus at least 15 hours of electives selected from the following (subject to the approval of the Head of School)

Applied Mechanics IV	28		14	Geology for Engrs.	28	14
Roads Engineering	42		14	Applied Mechanics V	28	14
Materials IV	42		14	Heat Transfer	28	14
Structures II	28		14	Soil Mechanics II	28	28
Engg. Management I	28			Engg. Management II	28	
Thermodynamics II	28		14	Public Health Engg.	42	14

MECHANICAL ENGINEERING

STAGE V

SESSION I				SESSION II			
Thermodynamics II	28		14	Heat Transfer	28		14
Control Systems I	28		14	Applied Mechanics V	28		14
Structures I	36		20	Exper. Engg. II	10		46
Fluid Mechanics II	28		14	General Studies	28		14

STAGE VI

	Hours per session			Hours per session	
	Lect.	Tut., Lab., Drg. Off.		Lect.	Tut., Lab., Drg. Off.
Design III	20	36	Design IV	20	36
Plus at least 15 hours of electives selected from the following (subject to the approval of the Head of School)					
Applied Dynamics I	28	14	Control Systems II	28	14
Thermodynamics III	28	14	Fluid Mechanics III	28	14
Systems Analysis I	28	14	Systems Analysis II	28	14
Engg. Management I	28		Engg. Management II	28	
Applied Elec. II	28	14	Applied Elec. II	28	14
Structures II	28	14	Applied Dynamics II	28	14
Applied Mechanics IV	28	14	Materials Handling Systems II	28	14
Materials Handling Systems I	28	14			

MINING ENGINEERING

		Hours per week Session 1	Session 2
STAGE 5:	Mining Engineering I, Parts 1 and 2	4	4
	Mining and mineral process engineering (Parts 1 and 2)*	2	2
	Engineering Surveying†	3	1
	Geology for mining engineers‡	3	5
	General Studies Elective	1½	1½
		13½	13½
STAGE 6:	Mining Engineering II§	5	5
	Mineral Processing I	3	3
	Mine Surveying and Control Engineering	1	1
	Mineral Industry Elective Project¶	2	2
	General Studies Elective	1½	1½
		12½	12½

* Includes four visits each of three hours to mines or mineral processing plants.

† Plus 42 hours of practical work at Survey Camp.

‡ Geology excursions will be conducted.

§ A mining excursion of five days will be conducted during the year.

¶ Project for an award with merit will be more advanced than that required for the award of the pass degree.

DEPARTMENT OF ELECTRICAL ENGINEERING

The Department offers a full-time course of four years' duration leading to the degree of Bachelor of Engineering, and a six-year part-time course for the degree of Bachelor of Science (Engineering). The courses may also be completed by a combination of part-time and full-time study. Graduate courses are described elsewhere.

The degrees of Bachelor of Engineering and Bachelor of Science (Engineering) are recognised by the Institution of Engineers, Australia, the Institution of Radio and Electronics Engineers, Australia, and the Institution of Electrical Engineers, London, as giving complete exemption from the examinations required for admission to Graduate or Corporate membership.

Electrical engineering, perhaps more than most other branches of engineering, is closely linked with the pure sciences, and requires a scientific outlook and approach for a proper understanding of the problems in electrical engineering.

In the early years of the electrical engineering courses, students concentrate on acquiring knowledge of the basic sciences, i.e. mathematics, physics, and chemistry, but with some introduction to engineering.

In the final year students will elect, with the approval of the Head of the Department, to study in the specialised fields of electrical engineering. At the same time they will take subjects common to all students in electrical engineering. A list of available electives (which may vary from year to year) is given in the course description. Students in doubt as to which programme patterns are desirable or permissible should consult the Head of the Department.

Each student in the full-time course is required to work on a project under the guidance of members of the lecturing staff. Generally, the project will involve the design and construction of experimental apparatus together with laboratory tests. Where possible the projects will be related to the research programme of the Department and chosen to develop the student's initiative. Each student will be required to deliver a seminar paper and to prepare a thesis based on the results of the project work.

In the Bachelor of Engineering course the identical formal programme will be offered to both Pass students and to those aiming at Honours. Honours will be awarded for meritorious performance over the course: special attention is paid to a candidate's performance in the final year thesis project. A student with a creditable performance in the Bachelor of Science (Engineering) course may be awarded a degree with Merit.

All students are strongly recommended to complete two periods of industrial training, one of forty-five working days between Years 2 and 3, and the other forty-five working days between Years 3 and 4. They are also advised to obtain practical experience during the long vacation between Years 1 and 2.

Double Degree of BSc, BE in Electrical Engineering

Students in Electrical Engineering may qualify for this double degree in five years of full-time study. Having completed the first and second years of the Electrical Engineering course, students transfer to Science (this is subject to the recommendation of the Head of the Department of Electrical Engineering and the approvals of the Deans of the Faculties of Engineering and Science) and do the appropriate General Studies subjects, and four Level III units chosen from related disciplines and no less than four other units of either Level II or Level III, chosen in accordance with the Science Course regulations. In their fourth year the students revert to the Department of Electrical Engineering. Depending on the programme followed in their year in Science they will have already completed parts of the normal third year programme of the Electrical Engineering course, and they will be required to omit these from their programme and to include an equivalent amount of other courses chosen with the approval of the Head of Department. In their fifth year they will complete the fourth year of the Electrical Engineering course.

ELECTRICAL ENGINEERING—FULL-TIME COURSE

Note: These courses are under review. For details of any changes, students should contact the Student Enquiries Section, First Floor, Administration Building.

BACHELOR OF ENGINEERING		**Hours per week**	
		Session 1	**Session 2**
YEAR 1:	Applied Mechanics I and Design I	6	6
	Materials I or Chemistry I	6	6
	Mathematics I	6	6
	Physics I	6	6
		24	24
YEAR 2:	Applied Mechanics II and III	3	3
	Circuit Theory 1	3	—
	Electronics 1	—	3
	Energy Conversion 1 and 2	3	3
	Physics II	6	6
	Mathematics II	5	5
	Strength of Materials and Materials II	3	3
	General Studies	1½	1½
		24½	24½
YEAR 3:	Applied Mechanics IV and V	3	3
	Circuit Theory 2 and 3	5	5
	Control 1	—	5
	Electronics 2 and 3	5	5
	Machines and Transformers 1 and 2	5	5
	Power Systems	5	—
	General Studies	3	3
		26	26
YEAR 4:	Electives (four)	12	12
	Engineering IVE	3	3
	Thesis	12	12
	General Studies	1½	1½
		28½	28½

	Hours per week Session 1	Session 2
Electives:		
Circuit Theory 4 and 5	3	3
Control 2 and 3	3	3
Computer Systems Engineering 1 and 2	3	3
Electrical Properties of Materials 1 and 2	3	3
Electronics 4 and 5	3	3
Machines 3 and 4	3	3

Only 4 of the listed electives are taken by individual students in each session.

ELECTRICAL ENGINEERING—PART-TIME COURSE*

BACHELOR OF SCIENCE (ENGINEERING)

STAGE 1:	Applied Mechanics I and Design I	6	6
	Mathematics I	6	6
		12	12
STAGE 2:	Physics I	6	6
	Materials I or Chemistry I	6	6
		12	12
STAGE 3:	Applied Mechanics II and III	3	3
	Circuit Theory I	3	—
	Electronics 1	—	3
	Mathematics II	5	5
	General Studies	1½	1½
		12½	12½
STAGE 4:	Energy Conversion I and II	3	3
	Thermodynamics I	3	—
	Strength of Materials	3	—
	Fluid Mechanics I	3	—
	Experimental Engineering I	—	3
	Materials IV	—	3
	General Studies	—	3
		12	12
STAGE 5:	Circuit Theory 2 and 3	5	5
	Machines and Transformers 1 and 2	5	5
	General Studies	—	3
	Applied Mechanics IV	3	—
		13	13
STAGE 6:	Applied Mechanics IV and V	3	3
	Control 1	—	5
	Electronics 2 and 3	5	5
	Power Systems	5	—
		13	13

* See Note, p. 82.

OUTLINES OF COURSE REQUIREMENTS—METALLURGY

BACHELOR OF SCIENCE—FULL TIME COURSE

		Hours per week		
		Lect.	Lab./Tut.	Total
YEAR 1:	Engineering I	4	2	6
	Mathematics I	4	2	6
	Physics I	3	3	6
	Chemistry I	3	3	6
				24
YEAR 2:	Chemistry IIM	3	3	6
	Mathematics II	1	1	2
	Design M	1	2	3
	Metallurgical Statistics	2	1	3
	General Studies	1	½	1½
	Metallurgy Subjects: Level 1	*	*	10
				25½
YEAR 3:	Applied Electricity 1/1	2	1	3
	General Studies	2	1	3
	Metallurgy Subjects: Level 2	*	*	20½
				26½
YEAR 4:	Engineering Management	2	–	2
	General Studies	1	½	1½
	Metallurgy Subjects: Level 3	*	–	11
	Metallurgy Project	–	8	8
	Applied Science/Engineering Option	2	–	2
				24½

BACHELOR OF SCIENCE (TECHNOLOGY) — PART-TIME COURSE

STAGE 1:	Engineering I	4	2	6
	Mathematics I	4	2	6
				12
STAGE 2:	Physics I	3	3	6
	Chemistry I	3	3	6
				12

* See Description of Subjects section for details of subjects and textbooks.

		Hours per week		
		Lect.	Lab./Tut.	Total
STAGE 3:	Chemistry IIM	3	3	6
	Mathematics II	1	1	2
	Design M	1	2	3
	General Studies	1	½	1½
				12½
STAGE 4:	*Metallurgy Subjects — Level 1*	*	*	10
	Metallurgical Statistics	2	1	3
				13
STAGE 5:	*Metallurgy Subjects — Level 2A*	*	*	10
	Applied Electricity 1/1	2	1	3
	General Studies	1	½	1½
				14½
STAGE 6:	*Metallurgy Subjects — Level 2B*	*	*	11
	Engineering Management	2	–	2
	General Studies	1	½	1½
				14½

* See Description of Subjects section for details of subjects and textbooks.

OUTLINES OF COURSE REQUIREMENTS — SCIENCE

GENERAL DESCRIPTION

The Regulations for this course are based on a unit structure. A unit occupies up to ninety hours of attendance at lectures and tutorials/laboratory classes. The requirements for a pass degree may be met by completing units chosen in accordance with the regulations in a minimum of three years of full-time or the equivalent period of part-time study. Subject to meeting conditions defined in the regulations, a student may be admitted to an honours course which will take an extra year of full-time study or two years of part-time study.

The unit structure allows flexibility in the choice of a course of study and the regulations have been framed so that a student may choose a pattern of units suitable for:

1. A general training in science.
2. A training for science teaching.
3. A professional level of training in a specific discipline.
4. A professional level of training in a combination of related disciplines.

Major sequences of units may be chosen from the following:

WOLLONGONG UNIVERSITY COLLEGE:

DIVISION OF BIOLOGICAL AND CHEMICAL SCIENCE
Chemistry

DIVISION OF PHYSICAL SCIENCE
Geology, Mathematics, Physics.

UNIVERSITY OF N.S.W.—KENSINGTON

FACULTY OF SCIENCE
Chemistry, Mathematics, Physics and Applied Physics.

FACULTY OF BIOLOGICAL SCIENCES
Biochemistry, Biological Technology, Botany, Microbiology, Psychology, and Zoology.

OTHER FACULTIES
Anatomy, Computer Science, Geology and Physiology.

REGULATIONS GOVERNING THE SCIENCE COURSE

1. Definitions

The Science course is administered by the Dean of the Faculty of Science through his nominated representative.

The pass degree is based on a unit* structure. A unit may be

* Not all units listed below are available at Wollongong University College. Information on those available may be obtained from the College Secretary.

of fourteen or twenty-eight weeks' duration, and units are grouped according to levels. Level I subjects are all double units; level II units normally follow after level I prerequisites and level III units, in most cases, follow after level II prerequisites. A major sequence normally includes four level III units chosen from those offered by a particular school,* although a number of schools offer more than four such units.

A prerequisite unit is one which must be completed prior to enrolment in the unit for which it is prescribed. A co-requisite unit is one which must either be completed successfully before or be studied concurrently with the unit for which it is prescribed. An excluded unit is one which cannot be counted together with the unit which excludes it towards the degree qualification. In exceptional circumstances, on the recommendation of the head of the appropriate school,† the Dean of the Faculty of Science may waive or vary a particular prerequisite or co-requisite.

CARE SHOULD BE TAKEN IN THE CHOICE OF UNITS TO ENSURE THAT THE PATTERN COMPLIES WITH THE REGULATIONS SET OUT IN SECTION 3 (a). CERTAIN COMBINATIONS OF UNITS CANNOT BE COMPLETED IN THE MINIMUM TIME DUE TO THE RESTRICTIONS OF TIMETABLES. COPIES OF TYPICAL COURSE PATTERNS ARE AVAILABLE FROM THE FACULTY OFFICE.‡

2. Regulations Governing the Science Course

(a) Requirements for a pass degree

In order to qualify for admission to the degree of Bachelor of Science under these regulations a candidate shall attend classes and satisfy the examiners in Science units and General Studies subjects chosen as follows—

(i) At least twenty-three Science units shall be included from the list set out in section 3 (a) and three General Studies subjects from the list in section 3 (b).

(ii) The twenty-three Science units shall comply with the prerequisites, co-requisites and exclusion conditions set out in section 3 (a) and also shall conform to the following restrictions:

not less than eight units, nor more than ten units may be from level I;

not less than four units may be from level III, and these four shall be chosen from related disciplines.

* At Wollongong University College there are departments instead of schools.

† The Head of the Department at Wollongong University College.

‡ At Wollongong University College the Head of the Department will provide the necessary advice.

(iii) One of 10.001 Mathematics I, or
10.011 Higher Mathematics I, *or*
10.021 Mathematics IT
shall be included.*

(iv) in addition to the specific prerequisites listed in Clause 3 (a), additional general prerequisites are required by some schools as a preliminary to certain advanced level units. These units, which are scheduled below, should be taken in the first year of enrolment together with compulsory mathematics. Eight units are normally taken in first year.

School of Chemistry	1.001, 1.011 or 1.041 Physics.*
School of Applied Geology	1.001, 1.011 or 1.041 Physics and 2.001 Chemistry.*
School of Biochemistry School of Microbiology School of Zoology	1.001, 1.011 or 1.041 Physics and 2.001 Chemistry and 17.001 General and Human Biology except that, with the consent of the Head of the particular School† concerned and in special circumstances, 25.111 Geoscience or 12.001 Psychology may be taken in lieu of Physics I in first year. In this case credit will not be given for level III units offered by these Schools† until level I Physics or 12.013 Psychology III is completed.*
School of Botany	1.001, 1.011 or 1.041 Physics and 2.001 Chemistry and 17.001 General and Human Biology except that, with the consent of the Head of School† and in special circumstances, Physics may be deferred to second year and 25.111 Geoscience or 12.001 Psychology taken in lieu in first year. In this case, credit will not be given for level III units offered by this School† until level I Physics is completed.*
School of Anatomy	17.001 General and Human Biology.
School of Physiology	2.001 Chemistry and 17.001 General and Human Biology.

* Subject numbers apply to subjects offered by the University of New South Wales (Kensington) only.

† The department at Wollongong University College.

(v) Only one from each of the following subjects/units may be included:

a. 12.001 Psychology or 26.121 Psychology.*

b. 52.111 Philosophy or 26.521 Philosophy.*

c. Any unit listed in Section 3 (a) or the equivalent unit offered at Wollongong University College which contains similar syllabus material.

(vi) A full time student is required to complete the appropriate level of Mathematics and six other approved level I units in the first two years of attendance or else show cause to the satisfaction of the Professorial Board why he should be allowed to re-enrol. The remaining units of the course may be completed in any order consistent with the requirements concerning prerequisite and co-requisite units as set out in Clause 3 (a).

(vii) *The proposed course must be approved by the Dean of the Faculty of Science or his representative at enrolment.*† In special circumstances, the Dean may grant a student permission to defer enrolment in certain level I units until the second year of the course. Where any alteration in the course approved at enrolment is desired, the student must obtain the approval of the Dean or his representative for the new course.

(b) Requirements for an honours degree

(i) In order to qualify for admission to the honours degree of Bachelor of Science a candidate shall:

1. Satisfy the requirements for a pass degree but without proceeding to graduation;

2. Undertake an extra year of full-time or two extra years of part-time study.

(ii) Admission to an honours course is granted by the Head of School.‡ Students wishing to proceed to an honours degree must apply to the Head of the appropriate school on completion of pass degree requirements.

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* Subject numbers apply to subjects offered by the University of New South Wales (Kensington) only.

† At Wollongong University College the Head of the Division.

‡ At Wollongong University College the Head of the Department.

(iii) A suitably qualified candidate may be admitted to an honours course in one of the following:

Anatomy	Geology
Applied Mathematics	Microbiology
Applied Physics	Physics
Biochemistry	Psychology
Biological Technology	Physiology
Botany	Pure Mathematics
Chemistry	Theory of Statistics
Computer Science	Zoology
Entomology	

(iv) To qualify for admission to an honours course a student must have completed successfully eight level III units in the pass degree course,* except that in special cases the Head of the appropriate school† may approve entry without such a qualification.

(v) Further to requirements listed in paragraph 2 (b)(iv), to qualify for entry into an honours year a student must have completed any special units at required grades as determined by the Head of the School,† prior to admission to the Honours year. In order to ascertain any such special conditions, a student contemplating honours is advised to consult the Head of School† at the end of the first year of study.

(vi) Upon admission to the honours course a student must attend lectures, read and engage in laboratory work as required by the Head of School.†

3. Schedule of Units

(a) Science units

These are listed under the Schools‡ which provide the instruction and are divided into levels. Students must observe the prerequisites and co-requisites. Some Schools offer higher units to which special prerequisites apply and which are designed to lead to honours. Students contemplating honours studies must ensure that they have selected appropriate units. Some units are terminating so that students taking these may not qualify to continue studies in that School.‡ When selecing terminating units students must ensure that a choice of a major sequence is still available. Note that many units are of half year duration so that it is necessary to choose units which give a balanced programme of study over the year.

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* For the honours course in Applied Physics the corresponding normal requirement is both (a) at least six Level III units to be completed and (b) at least eight units at Levels II and III to be completed at Credit grade or better or in the respective Higher version.

† At Wollongong University College the Head of the Department.

‡ Departments at Wollongong University College. Details of units available at Kensington are listed in the University Calendar and the Faculty of Science Handbook.

3 (a) Schedule of Science Units

DEPARTMENT OF CHEMISTRY

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
CHEMISTRY LEVEL I Part IA: Introductory Physical and General Chemistry Part IB: Introductory Organic and Physical Chemistry	I I	2	Double session subject 1st Session 2nd Session	6	Sc. Faculty entrance		
CHEMISTRY LEVEL II							
Physical Chemistry IIA	II	1	2nd Session	6	Chemistry level I	Mathematics level I	
Organic Chemistry II	II	1	1st Session	6	Chemistry level I	Mathematics level I	
Inorganic Chemistry II	II	1	2nd Session	6	Chemistry level I	Mathematics level I	
Physical Chemistry IIB	II	1	1st Session	6	Chemistry level I	Mathematics level I	
CHEMISTRY LEVEL III							
Organic Chemistry IIIA	III	1	2nd Session	6	Organic Chemistry II	—	—
Organic Chemistry IIIB	III	1	1st Session	6	Organic Chemistry II	—	—
Physical and Theoretical Chemistry IIIA	III	1	2nd Session	6	Physical Chemistry IIA	—	—

3 (a) Schedule of Science Units (cont.) DEPARTMENT OF CHEMISTRY (continued)

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
Physical Chemistry IIIB	III	1	1st Session	6	Physical Chemistry IIB	—	—
Inorganic Chemistry III	III	1	1st Session	6	Inorganic Chemistry II Physical Chemistry IIA	—	*
Spectroscopy III	III	1	2nd Session	6	Organic Chemistry II Physical Chemistry IIA	—	*
Analytical Chemistry IIIA	III	1	1st Session	6	Inorganic Chemistry II Physical Chemistry IIB	—	*
Analytical Chemistry IIIB	III	1	2nd Session	6	Inorganic Chemistry II Physical Chemistry IIB	—	*
CHEMISTRY HONOURS							
Honours lectures Part I	IV	—	1st Session	4	Chemistry, Level III		
Honours lectures Part II	IV	—	2nd Session	4	Chemistry, Level III		
Honours Project	IV	—	Double session	20		Honours parts I and II	

* Students taking a single major in Chemistry (4 Level III units) may not take more than two of the subjects marked *.

3 (a) Schedule of Science Units (cont.) **DEPARTMENT OF GEOLOGY**

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
GEOLOGY IW	I	2	Double session	6*	Sc. Faculty Entrance		
Unit A — Introductory Geology, Crystallography, Mineralogy and Petrology							
Unit B—Physical Geology, Palaeontology, Stratigraphy, and Mapping							
GEOLOGY IIW	II	4	Double session	6 hrs. per unit* for one session	Geology I		
Unit A— Crystallography, Crystal Chemistry and Mineralogy							
Unit B—Petrology							
Unit C— Palaeontology, Stratigraphy and Sedimentation							
Unit D—Elements of Geological Mapping							

* Plus field tutorials.

3 (a) Schedule of Science Units (cont.) DEPARTMENT OF GEOLOGY (continued)

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES†	CO-REQUISITES	EXCLUDED
GEOLOGY IIIW	III	9	Double session	6 hrs. per unit for one session*	Geology II (4 units) Chemistry I Mathematics I Physics I		
Unit A—Crystallography, Mineralogy, Igneous and Metamorphic Petrology							
Unit B—Geophysics and Statistical Methods in Geology							
Unit C—Sedimentary Rocks, Stratigraphy and Stratigraphic Palaeontology, Vertebrate Palaeontology							
Unit D—Structural Geology and Geotectonics, Economic Geology							

* Plus field tutorials.

† Progression to Geology IIIW without passes in all prerequisites may be possible with the approval of the Head of the Department.

3 (a) Schedule of Science Units (cont.) **DEPARTMENT OF GEOLOGY (continued)**

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
Unit E—Crystallography, Mineralogy and Petrology and Geochemistry							
Unit F— Exploration Geophysics, Petroleum and Nuclear Fuels							
Unit G— Basin Analysis, Sedimentation and Oceanography							
Unit H—Structural Geology, Geology of Coal							
Unit J— Advanced Geological Mapping, Geomorphology							

It should be noted that not all Geology IIIW units may be offered in any one year.

3 (a) Schedule of Science Units (cont.) **DEPARTMENT OF MATHEMATICS**

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
MATHEMATICS LEVEL I					Sc. Faculty Entrance		
Mathematics I	I	2	*	6			
MATHEMATICS LEVEL II					Mathematics I	Analysis I	
Analysis I	II	1	*	2			
Algebra I	II	1	*	2			
Theory of Functions I	II	1	*	2			
Dynamics	II	1	*	2			
Probability	II	1	*	2			
Numerical Analysis	II	1	*	2			
Geometry	II	1	*	2			
Complex Variable	II	1	*	2			
MATHEMATICS LEVEL III†							
Analysis II	III	1	*	2			
General Topology	III	1	*	2	Theory of Functions I		

* Double session subjects.
† Students intending to take Level III units normally must have passed at least three Level II units.

3 (a) Schedule of Science Units (cont.) **DEPARTMENT OF MATHEMATICS (continued)**

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
Algebra II	III	1	*	2	Algebra I		
Theory of Functions II	III	1	*	2	Theory of Functions I	Complex Variable	
Dynamics of Continuous Media	III	1	*	2			
Stochastic Processes	III	1	2nd session	4	Probability		
Mathematical Methods	III	1	*	2			
Operations Research	III	1	1st session	4			
Ocean Dynamics	III	1	*	2		Dynamics of Continuous Media	
Numerical Analysis II	III	1	*	2	Numerical Analysis I		
Partial Differential Equations	III	1	*	2			
Logic and Number Theory	III	1	*	2			
Ordinary Differential Equations	III	1	*	2			
MATHEMATICS HONOURS LEVEL IV†	IV						

* Double session subjects.
† Students intending to proceed to Honours should consult the Head of Department.

3 (a) Schedule of Science Units (cont.) **DEPARTMENT OF PHYSICS**

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
PHYSICS, LEVEL I Mechanics	I	1	*	3	Sc. Faculty Entrance	Electricity and Magnetism (Level I)	
Electricity and Magnetism	I	1	*	3	Sc. Faculty Entrance	Mechanics (Level I)	
PHYSICS, LEVEL II Electromagnetism and Optics	II	1	*	3		Mechanics, Thermodynamics and Statistical Physics	
Atomic Physics, Nuclear Physics and Wave Mechanics	II	1	*	3		Electromagnetism and Optics	
Mechanics, Thermodynamics and Statistical Physics	II	1	*	3		Electromagnetism and Optics	
Astronomy	II	1	*	3		Nil	
PHYSICS, LEVEL III Classical Mechanics and Quantum Mechanics	III	1	*	3	3 level 2 units		

* Double session subjects.

3 (a) Schedule of Science Units (cont.) **DEPARTMENT OF PHYSICS (continued)**

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
Astrophysics	III	1	*	3		Classical Mechanics and Quantum Mechanics; Solid State Physics and Nuclear Physics; Statistical Mechanics and Kinetic Theory	
Solid State Physics and Nuclear Physics	III	1	*	3		Classical Mechanics and Quantum Mechanics	
Statistical Mechanics and Kinetic Theory	III	1	*	3		Classical Mechanics and Quantum Mechanics	
Laboratory Project	III	1	*	3	Permission of the Head of the Department of Physics is required.		
PHYSICS, LEVEL IV							
Quantum Mechanics†	IV		*	1			
Statistical Mechanics†	IV		*	1			
Nuclear Fields†	IV		*	1			

* Double session subjects.

3 (a) Schedule of Science Units (cont.) DEPARTMENT OF PHYSICS (continued)

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
Solid State†	IV		*	1			
Astrophysics†	IV		*	1			
Plasma Physics†	IV		*	1			
Physics of Measurement†	IV		*	1			
Nuclear Astrophysics†	IV		*	1			
Honours Thesis	IV		*	20			

Note: As a general rule, units at any level should be attempted only after completion of all units at the preceding level. In case of doubt the Head of the Department should be consulted.

3 (a) Schedule of Science Units (cont.) SCHOOL OF CIVIL, MECHANICAL AND MINING ENGINEERING

NAME	LEVEL	UNITS VALUE	WHEN OFFERED	HOURS P.W.	PREREQUISITES	CO-REQUISITES	EXCLUDED
ENGINEERING I‡	I	2	*	6	Sc. Faculty Entrance		

* Double session subjects.
† Physics Level IV units may be altered without notice depending on the availability of staff.
‡ Comprising the session subjects *Applied Mechanics I* and *Design I*.

DEPARTMENT OF BIOLOGICAL SCIENCES

GENERAL AND HUMAN BIOLOGY	I	2	*	6	Sc. Faculty Entrance		

DEPARTMENT OF GEOGRAPHY

GEOGRAPHY I	I	2	*	4	Sc. Faculty Entrance		
GEOGRAPHY II	II	3	*	6	Geography I		

DEPARTMENT OF PSYCHOLOGY

PSYCHOLOGY I	I	2		6	Sc. Faculty Entrance		
Motivation, Development and Adjustment	I	1	1st session	3	Sc. Faculty Entrance		
Psychological Measurement	I		1st session	3	Sc. Faculty Entrance		
Psychobiology	I	1	2nd session	3	Sc. Faculty Entrance		
Laboratory Method I	I		2nd session	3	Psychological Measurement I		
PSYCHOLOGY II	II	3	*	9	Psychology I		
PSYCHOLOGY IIIA(i)†	III	1	1st session	6	Psychology II		
PSYCHOLOGY IIIA(ii)†	III	1	2nd session	6	Psychology IIIA(i)		
PSYCHOLOGY IIIB(i)†	III	1	1st session	6	Psychology II	Psychology IIIA(i)	
PSYCHOLOGY IIIB(ii)†	III	1	2nd session	6	Psychology IIIB(i)	Psychology IIIA(ii)	

* Double session subjects.

† Science students wishing to do a single major in Psychology at third year level must take all 4 units.

(b) General Studies

Students shall select six of the following subjects:

A History of Modern Art, Part I
A History of Modern Art, Part II
Architecture, Part I
Architecture, Part II
Aspects of Industrial Society
Aspects of Modern Psychology, Part I
Aspects of Modern Psychology, Part II
Contemporary History, Part I
Contemporary History, Part II
Developments in Present Day Music
English Language and Literature
Introduction to English Linguistics
Population Studies

For honours students an advanced elective is offered:
Asia in the Twentieth Century

4. Pattern of Studies

In general, a student should select a course which is adequately distributed over the six half years of study. Typical course patterns are available from the Faculty Office.*

A suggested pattern of study is:—

First year: The appropriate two units of level I Mathematics and six other level I units including those essential to the intended major sequence of units.

Second year: One general studies elective and eight units from level II or six units from level II and two from level I.

Third year: Two general studies electives and at least four level III units. The other units could be level II or III.

Fourth year: For an honours degree, an advanced general studies elective and such requirements as specified by the Head of the appropriate School.*

5. Part-time Study

A student must select the units and general studies electives in accordance with these regulations save that Clause 2a (vi) is modified so that he must complete level I Mathematics and six other level I units in the first four years of enrolment or else show cause to the satisfaction of the Professorial Board why he should be allowed to re-enrol.

* At Wollongong University College, the Head of the Department.

RULES GOVERNING ADMISSION TO THE SCIENCE DEGREE COURSE WITH ADVANCED STANDING

1. Graduates of the University of New South Wales may be admitted to the Science degree course with exemption in all General Studies subjects completed by them and in no more than twelve Science course units completed by them.

2. Undergraduates of the University of New South Wales who transfer from another course to the Science degree course, may be admitted to the Science degree course with exemption in all General Studies subjects completed by them and in all Science course units completed by them. Further, where an undergraduate has completed a subject which contains the syllabus material of a Science course unit (or units) the Dean, with the agreement of the Head of the School* offering the Science course unit (or units) may allow the unit (or units) so covered to be counted to a Bachelor of Science degree.

   An undergraduate transferring to the Science course must take Mathematics 10.021 or 10.001 or 10.011† during his first year of enrolment in the course unless one of them has previously been completed.

3. Graduates or undergraduates of other universities or of other approved tertiary institutions may be admitted to the Science degree course with advanced standing.

4. Students admitted under Rule 3 who have satisfied the examiners in units of the same title or subject matter as Science course units in this University may, subject to the approval of the appropriate Heads of School,* be granted exemption in no more than eleven Science course units but not including level III Science course units.

5. Notwithstanding the provisions of Rules 1, 2, 3 and 4 Faculty may determine a special programme to be completed by a student who wishes to be granted advanced standing for an honours degree of Bachelor of Science in this University.

RULES GOVERNING ADMISSION TO THE SCIENCE DEGREE COURSE WITH ADVANCED STANDING FOR THE PURPOSE OF OBTAINING A DOUBLE DEGREE

1. Undergraduates‡ of the University of New South Wales who have satisfied the examiners in at least the first two years of

* At Wollongong University College, the Head of the Department.

† Subject numbers apply to subjects offered by the University of New South Wales (Kensington) only.

‡ The word "undergraduate" includes graduands, i.e. a person may be admitted under these rules if he has met all requirements for a first degree which has not yet been conferred on him and his admission under these rules shall be no bar to the subsequent award of the first degree.

a degree course extending over four or more years and approved by the Faculty of Science for the purpose of double degrees, may be admitted to the Science degree course with advanced standing. Such undergraduates' performance shall have been of a high standard and their admission shall be subject to the approval of the Dean of the Faculty of Science.

2. Students so admitted who have satisfied the examiners in General Studies subjects and/or Science course units shall be given advanced standing in such General Studies subjects and no more than fourteen such Science course units.

3. Students so admitted may be granted exemption from two other level II Science units on the basis of other subjects completed by them.

4. In order to qualify for the award of the degree of BSc, students so admitted with advanced standing shall be required to complete the appropriate General Studies subjects and no less than four units of either level II or level III and four other level III units in accordance with the Science course regulations.

   The units submitted for the Bachelor's degree under these regulations must include at least four level III units chosen from related disciplines in accordance with the Science course regulations. One of Mathematics 10.021 or 10.001 or 10.011* must be included in the course.

* Subject numbers apply to subjects offered by the University of New South Wales (Kensington) only.

Description of Subjects

ACCOUNTANCY

Compulsory Subjects for Pass Degree

Accounting and Financial Management IA

First session subject

The basic concepts of financial model building and information systems, including the double-entry recording system, the accounting cycle, income measurement and financial reporting and an introduction to basic elements of taxation and auditing.

TEXTBOOKS

Carrington, A. S., Battersby, G. B. & Howitt, G. *Accounting—An Information System.* Whitcombe & Tombs, 1974.

Grouse, P. J. *An Introduction to Computer Programming in PL/1. Part 1. The Simple Subset.* 2nd ed. New College Publications, 1972.

Mathews, R. *The Accounting Framework.* 3rd rev. ed. of *Accounting for Economists.* Cheshire, 1972.

Accounting and Financial Management IB

Second session subject

Development of basic concepts introduced in *Accounting and Financial Management IA* including management accounting and operations research, corporate reporting, business finance, system design, elementary computer programming and applications.

TEXTBOOKS

As for *Accounting and Financial Management IA.*

Accounting and Financial Management IIA

First session subject

The design, production and use of accounting and other quantitative information in the planning and control of organisations, with particular reference to manufacturing activities and to long and short-term decision-making and financial planning.

TEXTBOOKS

Burke, W. L. & Smyth, E. B. *Accounting for Management.* 2nd ed. Law Book Co., 1972.

Chase, R. B. & Aquilano, N. J. *Production and Operations Management.* Irwin, 1973.

Horngren, C. T. *Cost Accounting: A Managerial Emphasis.* 3rd ed. Prentice-Hall, 1972.

Accounting and Financial Management IIB

Second session subject

A critical examination of concepts and problems in income measurement and financial reporting for various forms of undertaking with particular reference to corporate organisations, including associated aspects of auditing and taxation.

TEXTBOOKS

Hendriksen, E. S. *Accounting Theory.* Rev. ed. Irwin, 1970.

Johnston, T. R., Jager, M. O. & Taylor, R. B. *Company Accounting.* 3rd ed. Butterworth, 1973.

The Companies Act 1961 (as amended). Government Printer, Sydney.

Thomas, A. L. *Financial Accounting: The Main Ideas.* Wadsworth, 1972.

Accounting and Financial Management IIIA

First session subject

Financial Accounting: Advanced aspects of financial accounting and reporting with particular reference to developments in accounting theory and professional standards, including the financial and accounting aspects of mergers and group companies.

TEXTBOOKS

Hendriksen, E. S. *Accounting Theory.* Rev. ed. Irwin, 1970.
Johnston, T. R., Jager, M. O. & Taylor, R. B. *Company Accounting.* 3rd ed. Butterworth, 1973.
Lee, L. N. & McPherson, L. A. *Consolidated Statements and Group Accounts.* Law Book Co., 1963.
The Companies Act 1961 (as amended). Government Printer, Sydney.

Accounting and Financial Management IIIB

Second session subject

Management Accounting: An advanced treatment of management accounting theory and applications including statistical cost analysis, cost accounting, control systems, budgetary and strategic planning and decision models.

TEXTBOOKS

To be determined before second session 1974.

Law in Society

First session subject

An introduction to the nature of law, the legal system, legal reasoning and the administration of justice, including the sociological and political implications of the legal environment.

TEXTBOOKS

Derham, D., Maher, F. K. H. & Waller, L. *An Introduction to Law.* 2nd ed. Law Book Co., 1971.
Friedman, W. *Law in a Changing Society.* Penguin, 1972.
Lloyd, D. *The Idea of Law.* Pelican, 1969.
Sawer, G. *The Australian and the Law.* Pelican, 1971.

Information Systems

First session subject

Management information systems, including data collection and processing, internal control and internal reporting. System design and computer applications.

TEXTBOOKS

Grouse, P. J. *An Introduction to Computer Programming in PL/1. Part 1. The Simple Subset.* 2nd ed. New College Publications, 1972.
Sanders, D. H. *Computers in Business: An Introduction.* 2nd ed. McGraw-Hill, 1972.

Business Finance

Second session subject

The finance function, with particular reference to corporate financing, financial policy and financial management, including aspects of Australian financial institutions and the development of theories of financial structure.

TEXTBOOKS

Cohan, A. B. & Wyman, H. E. *Cases in Financial Management.* Prentice-Hall, 1972.

Weston, J. F. *The Scope and Methodology of Finance.* Prentice-Hall, 1966.

Weston, J. F. & Brigham, E. F. *Managerial Finance.* 4th ed. Holt, Rinehart & Winston, 1972.

Optional Subjects for Pass Degree

Note: The availability of optional subjects will depend on sufficient student enrolments and the availability of staff.

Advanced Auditing

First session subject

Advanced aspects of auditing, including auditing standards and responsibilities, problems of valuation and verification, organisation and application to various forms of accounting systems including computer systems, and investigations.

TEXTBOOKS

Mautz, R. K. & Sharaf, H. A. *The Philosophy of Auditing.* American Association, 1961.

Stettler, H. F. *Auditing Principles.* 3rd ed. Prentice-Hall, 1970.

Stolle, C. & Bearden, G. *Auditing of Computer-Generated Accounts: A Simulation.* McGraw-Hill, 1971.

Vanasse, R. W. *Statistical Sampling for Auditing and Accounting Decisions: A Simulation.* McGraw-Hill, 1968.

Advanced Business Finance

First session subject

Advanced aspects of corporate financial management, growth strategies, combinations and reorganisations; theories and models of capital structure and cost of capital.

TEXTBOOKS

No prescribed textbooks.

Advanced Information Systems

Second session subject

Advanced aspects of communication and information theory, system evaluation, design, implementation and management, accounting and associated computer applications, and software development.

TEXTBOOKS

Bates, F. & Douglas, M. L. *Programming Language/One.* 2nd ed. Prentice-Hall, 1970.

Prince, T. R. *Information Systems for Management Planning and Control.* Rev. ed. Irwin, 1970.

Sanders, D. H. *Computers and Management.* McGraw-Hill, 1970. Paperback.

Sanders, D. H. *Computers in Business: An Introduction.* 2nd ed. McGraw-Hill, 1972.

Business Law I

Second session subject

Common Law and statutes relating to business, with special reference to the law of contracts, sale of goods and an introduction to the law relating to business organisations.

TEXTBOOKS

Vermeesch, R. B. & Lindgren, K. E. *Business Law in Australia.* 2nd ed. Butterworth, 1973.

Statutes:

Partnership Act (N.S.W.) 1892. Government Printer, Sydney.
Sale of Goods Act (N.S.W.) 1923 (as amended). Government Printer, Sydney.

Business Law II

First session subject

The law relating to business organisations, with particular reference to companies, and other areas of law relevant to commerce, including banker and customer, hire purchase, insurance and bankruptcy.

TEXTBOOKS

Gower, L. C. B. *The Principles of Modern Company Law.* 3rd ed. Stevens, 1969.
Mason, H. H. & O'Hair, J. *Australian Company Law.* 2nd ed. McGraw-Hill, 1968.
Sim, R. S. & Mason, H. H. *Casebook on Australian Company Law.* Butterworth, 1971.
or
Afterman, H. B. & Baxt, R. *Cases and Materials on Corporations and Associations.* Butterworth, 1972.
Statute:
Companies Act (N.S.W.) 1961 (as amended to date). Government Printer, Sydney.

Business Organisation and Policy

First session subject

The relationship of organisation theories and behavioural considerations to the functions of management and of accounting, with particular reference to organisation structures, communication, motivation, inter-personal and inter-group relationships and decision processes. Corporate strategy, policy formulation and integration of business functions.

TEXTBOOKS

Emery, F. E. *Systems Thinking.* Penguin, 1969.
Hutchinson, J. G. *Management Strategy and Tactics.* Holt, Rinehart & Winston, 1971.
Leavitt, H. J. *Managerial Psychology.* 3rd ed. Chicago U.P., 1972.
Newman, W. H., Summer, C. E. & Warren, E. K. *The Process of Management.* 3rd ed. Prentice-Hall, 1972.

Industrial Law

Session to be determined.

An examination of the Commonwealth and State systems, the relationship between them and the effect on industrial relations of the Australian Federal system; with particular reference to the constitution of the

tribunals, their respective powers and the effect of awards, agreements and other regulatory activities.

TEXTBOOKS

Cullen, C. L. & Macken, J. J. *An Outline of Industrial Law*. 3rd ed. Law Book Co., 1972.
Isaac, J. E. & Ford, G. W. eds. *Australian Labour Relations: Readings*. 2nd ed. Sun Books, 1971.
O'Dea, R. *Industrial Relations in Australia*. 2nd ed. West, 1970.

Taxation Law

Second session subject

Income tax law and practice.

TEXTBOOKS

Australian Master Tax Guide. C.C.H. Australia, 1973.
Australian Master Tax Guide. C.C.H. Australia, 1974 (available April, 1974).
Income Tax Assessment Act, 1936-1973. C.C.H. Australia.

Compulsory Subjects for Honours Degree

Accounting and Financial Management III (Honours)

An extension of the work included in the subjects Accounting and Financial Management IIIA and IIIB, and an introduction to the nature of research, theory formation and validation.

TEXTBOOKS*

No prescribed textbooks.

Accounting Theory

The nature of research, theory formation and validation. The nature of accounting. A study of the methods used in accounting theory formation, and of attempts to formulate theories of accounting.

TEXTBOOKS*

No prescribed textbooks.

Current Developments in Accounting Thought—Financial

Review of objectives and functions of external reporting with particular reference to problems of periodic income measurement, value and valuation, and communication. Evaluation of accounting measurement and valuation methods, including historical cost, general price level accounting, current value and relative price change accounting models. Contemporary developments in accounting thought arising from alterations in social attitudes, the law and professional pronouncements.

TEXTBOOKS*

No prescribed textbooks.

*Reading is required from a wide variety of references, including books and journal articles. Specific recommendations may be obtained from the Accountancy Department.

Current Developments in Accounting Thought—Managerial

The conceptual basis of managerial accounting and information systems. Management systems and the management process. Business objectives; multiple and conflicting goals. Qualification of objectives. Information theory and communication within organizations. Developments in decision models, project and period planning, budgetary models and control systems, and measurement of performance, including motivation and behavioural considerations.

TEXTBOOKS*

No prescribed textbooks.

Optional Subjects for Honours Degree

Note: The options to be offered in any session will depend on the availability of staff and sufficient student enrolments.

Management Planning and Control

Planning and control problems of decentralized organizations. Budgeting for and control of expense centres, plants and profit centres. Evaluation of managerial performance. Non-profit measures of performance. Interdivisional arrangements. Internal profit measurement and transfer pricing. Administration of the capital budget. Organization, staffing and appraisal of the accounting and information services.

TEXTBOOKS*

No prescribed textbooks.

Studies in Taxation

The statutory and common law foundations of the Federal income tax system. Common Law concepts of income and capital and statutory modifications and interpretations of these concepts. Legal and accounting approaches to taxable income. Tax and estate planning concepts. Tax avoidance and evasion. Tax incidence and equity. An examination of tax policies, provisions and problems relating to special entities—companies, partnerships, trusts, superannuation schemes—and special provision areas, such as primary producers, mining and petroleum industries, non-residence, foreign-controlled companies and royalty provisions. International aspects of Australian income tax including double tax agreements.

TEXTBOOKS*

No prescribed textbooks.

International Accounting

Differences in accounting thought and standards between countries. Influence of national outlook and policies and of economic infra-structure on accounting practice. Accounting developments in State-controlled economies and in developing countries. Comparative study of accounting in developed nations. Uniform systems of accounting. Corporate growth and its impact on accounting and auditing. Comparative study of auditing and reporting standards, and international aspects of public accounting practice. The multi-national corporation. The effect of changing price levels on accounting for international operations.

*Reading is required from a wide variety of references, including books and journal articles. Specific recommendations may be obtained from the Accountancy Department.

TEXTBOOKS*
No prescribed textbooks.

History and Development of Accounting Thought

An examination of the environmental factors and processes by which accounting thought, practices and institutions originated and developed in the ancient, mediaeval and modern eras. Ancient accounts. Special-purpose account-keeping in the Middle Ages. Philosophy, influence and constraints of the double-entry system. Development of basic concepts of continuity, accrual accounting and limited liability. Impact of the Industrial Revolution and changing corporate environments on accounting development. Legislative and institutional influences on accounting. Origin and development of educational and professional accountancy bodies and their influence on the development of accounting thought. Historical development of modern cost accounting.

TEXTBOOKS*
No prescribed textbooks.

Issues in Financial Accounting and Reporting

Contemporary issues in the field of financial accountability to external parties, particularly in respect of corporate organisations. Legal, institutional, and professional reporting requirements. Financial accounting aspects of short term assets including inventories and long-lived assets and liabilities including intangibles, leases, pensions, long service leave and tax allocation. Proposals for improvement in external reporting.

TEXTBOOKS*
No prescribed textbooks.

Investment Analysis and Management

The theory of optimal investment decisions. Cost of capital. Introduction to portfolio theory and capital markets. Portfolio analysis. Sources of investment information. Investment media and strategies. Analysis of corporate performance and securities.

TEXTBOOKS*
No prescribed textbooks.

*Reading is required from a wide variety of references, including books and journal articles. Specific recommendations may be obtained from the Accountancy Department.

CHEMISTRY

INTRODUCTORY (LEVEL I) COURSES

General and Human Biology

Double session subject (84 hrs. lectures, 28 hrs. tutorials and 56 hrs. practical).

This is an introductory course for students intending to proceed in the biological sciences.

Syllabus: Characteristics of living organisms. Properties of living matter. Cell structure and function. Life cycles. An introduction to biochemistry, ultrastructure, genetics and cytology. Plant structure and function. Physiology of vertebrate animals. Human biology and variation. The biology of micro-organisms. Evolution. Anatomy and histology of selected animals. Practical work to illustrate the lecture course.

TEXTBOOKS

Abercrombie, M., Hickman, C. J. & Johnson, M. L. *A Dictionary of Biology.* Penguin.

Keeton, W. T. *Biological Science.* Norton, N.Y., 1967.

Kelly, P. J. *Evidence and Deduction in Biological Science.* Penguin, 1971.

Requirements for Practical Work: Students will be notified of equipment required for practical work. This must be purchased before the first practical class.

Chemistry Level I

Part 1A. Introductory Physical and General Chemistry.

First session subject (28 hrs. lectures, 14 hrs. tutorials and 42 hrs. practical).

Atomic theory and structure, chemical bonding, shapes of molecules. Particle theory of matter, gases and liquids, thermodynamics and thermochemistry.

Part 1B. Introductory Organic and Physical Chemistry.

Second session subject (28 hrs. lectures, 14 hrs. tutorials and 42 hrs. practical).

Chemical equilibrium and equilibrium constants. Acids and bases. Nomenclature, preparation and reactions of carbon compounds. Stereochemistry.

TEXTBOOKS

Brescia, F. et al. *Fundamentals of Chemistry.* Academic Press, 1970.

Pierce, C. & Smith, R. N. *General Chemistry Workbook.* 4th ed. Freeman, 1971.

Richards, J. H., Cram, D. J. & Hammond, G. S. *Elements of Organic Chemistry.** McGraw-Hill, 1967.

or for students intending to continue in Chemistry,

Hendrickson, J. B., Cram, D. J. & Hammond, G. S. *Organic Chemistry.** McGraw-Hill, 1970.

* Not required for Part 1A.

REFERENCE BOOK

Barrow, G. M. et al. *Understanding Chemistry.* Benjamin, N.Y., 1969.

MAJOR COURSES IN CHEMISTRY

All units of the Chemistry course are single session subjects which consist of 28 hours lectures, 14 hours tutorials and 42 hours practical. There are four second level units and eight third level units.

Students may elect to take either a double major in Chemistry or a single major in Chemistry. A double major consists of four second level Chemistry units and eight third level Chemistry units. A single major consists of at least four third level Chemistry units and either three or four second level Chemistry units. Students taking only three second level Chemistry units will have their choice of third level units restricted by the prerequisite requirements listed in section 3 of the "Regulations Governing the Science Course". Students taking a single major in Chemistry may not take more than two of the following third level units except by permission of the Head of Department:

Inorganic Chemistry III
Spectroscopy III
Analytical Chemistry IIIA
Analytical Chemistry IIIB

No reference books are listed for the Chemistry units. Students will be provided with a list of recommended reading at the commencement of each course.

SECOND LEVEL CHEMISTRY SUBJECTS

Physical Chemistry IIA

Single session subject

Introductory Quantum Chemistry: Applications of quantum theory to the extra-nuclear structure of atoms. Applications to other chemical and physical systems. Molecular energies from both quantum mechanical and classical viewpoints.
Kinetic Theory: The study of rate processes. Collision theory and transition state theory. Applications to chemical systems.

TEXTBOOKS

Barrow, G. M. *Physical Chemistry.* 3rd ed. McGraw-Hill, 1973.
Dickson, T. R. *The Computer and Chemistry.* Freeman, 1968.

Physical Chemistry IIB

Single session subject

Chemical thermodynamics (1st, 2nd and 3rd laws). Application of thermodynamics to chemical systems. Nature of electrolyte solutions and electrode processes.

TEXTBOOK

Barrow, G. M. *Physical Chemistry.* 3rd ed. McGraw-Hill, 1973.

Inorganic Chemistry II

Single session subject

Systematic chemistry of some transition elements and non-metals. Introduction to coordination chemistry. Theories of Blomstrand-Jorgensen and Werner. The coordinate bond, stereoisomerism. Elementary magnetochemistry. Molecular orbital theory of bonding.

TEXTBOOKS

Basolo, F. & Johnson, R. C. *Co-ordination Chemistry.* Benjamin, 1964.
Cotton, F. A. & Wilkinson, G. *Advanced Inorganic Chemistry.* 3rd ed. Wiley, 1972.

Organic Chemistry II

Single session subject

Survey of the more important organic reactions classified from the viewpoint of reaction mechanism. Nucleophilic substitution. Nucleophilic addition. Nucleophilic substitution of carbonyl and related compounds. Electrophilic substitution. Oxidation and reduction. Molecular rearrangements. Organic synthesis.

TEXTBOOKS

Hendrickson, J. B., Cram, D. J. & Hammond, G. S. *Organic Chemistry.* 3rd ed. McGraw-Hill, 1970.

Mann, F. G. & Saunders, B. C. *Practical Organic Chemistry.* 4th ed. Longmans, Green & Co., 1960.

Sykes, P. *A Guidebook to Mechanism in Organic Chemistry.* 2nd ed. Longmans, 1967.

THIRD LEVEL CHEMISTRY SUBJECTS

Organic Chemistry IIIA

Single session subject

Stereochemistry. Heterocyclic chemistry. Non-benzenoid aromatic and condensed ring systems.

TEXTBOOKS

Badger, G. M. *Aromatic Character and Aromaticity.* C.U.P., 1969.

Eliel, E. L. *Stereochemistry of Carbon Compounds.* McGraw-Hill, 1962.

Paquette, L. A. *Principles of Modern Heterocyclic Chemistry.* Benjamin, 1968.

Organic Chemistry IIIB

Single session subject

Synthetic organic chemistry. Natural products and biosynthesis.

TEXTBOOKS

Bodansky, M. & Ondetti, M. A. *Peptide Synthesis.* Interscience, 1966.

Hendrickson, J. B. *The Molecules of Nature.* Benjamin, 1964.

Carruthers, W. *Some Modern Methods of Organic Synthesis.* C.U.P., 1971.

or

House, H. O. *Modern Synthetic Reactions.* 2nd ed. Benjamin, 1972.

Physical and Theoretical Chemistry IIIA

Single session subject

Reaction kinetics and reaction mechanisms. Correlation of molecular structure with chemical reactivity. Theoretical chemistry of simple molecules. Theoretical chemistry applied to organic molecules. Quantum mechanical theory of electronic structure and bonding.

TEXTBOOKS

Riggs, N. V. *Quantum Chemistry.* Macmillan, 1970.

Wiberg, K. *Physical Organic Chemistry.* Wiley, 1964,

or

Hammett, L. P. *Physical Organic Chemistry.* 2nd ed. McGraw-Hill, 1970.

Physical Chemistry IIIB

Single session subject

Thermodynamics of non-ideal systems. Surface chemistry and colloids. Chromatography.

TEXTBOOKS

Shaw, D. J. *Introduction to Colloid and Surface Chemistry.* Butterworth, 1966.

Stock, R. & Rice, C. B. F. *Chromatographic Methods.* 2nd ed. Chapman & Hall, 1967.

Spectroscopy III

Single session subject

Topics chosen from: I.R. and U.V. spectroscopy. Nuclear magnetic resonance and electron spin resonance. Mass spectrometry. Atomic absorption spectroscopy. X-ray crystallography. Emission spectroscopy.

TEXTBOOKS

Brittain, E. F. H., George, W. O. & Wells, C. H. J. *Introduction to Molecular Spectroscopy.* Academic Press, 1970.

Shapiro, R. H. *Spectral Exercises in Structural Determination of Organic Compounds.* Holt, Rinehart & Winston, 1970.

Inorganic Chemistry III

Single session subject

Coordination chemistry: The coordinate bond; stereochemistry; types of coordination compounds. *Ligand Field Theory:* Absorption spectra; Orgel diagrams; Jahn Teller effect. *Magnetochemistry:* The magnetic properties of the free ion; effect of crystal fields on magnetic properties; molecular anti-ferromagnetism.

TEXTBOOKS

Cotton, F. A. & Wilkinson, G. *Advanced Inorganic Chemistry.* 3rd ed. Interscience, 1972.

Earnshaw, A. *Introduction to Magnetochemistry.* Academic Press, 1968.

Sutton, D. *Electronic Spectra of Transition Metal Complexes.* McGraw-Hill, 1968.

Analytical Chemistry IIIA

Single session subject

General analytical chemistry. Ionic equilibria in analytical chemistry.

TEXTBOOKS

Freiser, H. & Fernando, Q. *Ionic Equilibria in Analytical Chemistry.* 2nd ed. Wiley, 1966.

Fritz, J. S. & Schenk, G. *Quantitative Analytical Chemistry.* 2nd ed. Allyn & Bacon, 1969.

Analytical Chemistry IIIB

Single session subject

Electrochemistry. Radiochemistry. Trace analysis and environmental chemistry.

TEXTBOOKS

Wilson, N. H. *An Approach to Chemical Analysis.* Pergamon, 1966.

Second Level Chemistry for Metallurgists

Comprises *Physical Chemistry IIA* and *Chemistry IIM.*

Physical Chemistry IIA

Single session subject

Introductory Quantum Chemistry: Applications of quantum theory to the extra-nuclear structure of atoms. Applications to other chemical and physical systems. Molecular energies from both quantum mechanical and classical viewpoints.

Kinetic Theory: The study of rate processes. Collision theory and transition state theory. Applications to chemical systems.

TEXTBOOKS

Barrow, G. M. *Physical Chemistry.* 3rd ed. Mc-Graw Hill, 1973.
Dickson, T. R. *The Computer and Chemistry.* Freeman, 1968.

Chemistry IIM *(for Metallurgy students only)*

Single session subject

Analytical Procedures: Sampling, solutions, separation methods, analysis techniques, statistical treatment of data.

Methods of Analysis: Gravimetric, volumetric—acid-base, redox, complexometry—spectroscopy, electrochemistry, extraction techniques.

TEXTBOOK

Fritz, J. S. & Schenk, G. *Quantitative Analytical Chemistry.* 2nd ed. Allyn & Bacon, 1969.

CIVIL, MECHANICAL AND MINING ENGINEERING

YEAR I

Applied Mechanics I

First session subject

(a) Engineering Mechanics

Two dimensional force systems; laws of equilibrium; concurrent and non-concurrent forces; funicular polygon; statics applied to rigid bars; statics of pin-jointed frames, analytical and graphical treatment; concepts of shear force, axial force and bending moment; simple states of stress; three-dimensional statics; composition and resolution of forces; general laws of equilibrium; dynamics of a particle; graphical and analytical analysis of velocities, accelerations; relative motion and energy conservation. Introduction to rigid body dynamics.

(b) Introduction to Computers and Systems

Computers: Information-concepts, representation storage and manipulation in automatic systems; algorithms—transformation of information by algorithms, expression in flow charts and languages, iterative and recursive algorithms; computer organisation—user languages and hardware organisation, number and data representation, instruction sets, basic organisation, computer components, present and future uses of computers.

Systems: General introduction to systems involving consideration of the basic concepts of systems, system components and quantities involved. These concepts to be related to the phenomena within the experience of the students and to be illustrated by case histories and engineering examples.

PRESCRIBED TEXTBOOKS

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One three-hour paper at end of course and class assignments.

Design I

Second session subject

(a) Principles of Engineering Drawing and Design

Limits and fits; elementary rivetted, bolted and welded connections; couplings and bearings; brakes, clutches, power screws and springs. Conceptual design.

(b) Engineering Technology

Materials: Classification of materials in common use, occurrence of raw materials, processing of raw materials, refinements and properties of materials. *Manufacture:* description and appraisal of the processes classified as forming from liquid or solid, material removal, materials joining. *Machines:* analysis of the primary functions of the machine tools and an appraisal of their limitations; principles of operations of common machine tools and illustration of their use.

PRESCRIBED TEXTBOOKS

A.S.CZ-1. 1966. *Australian Standard Engineering Drawing Practice.* I.E.Aust., 1972.

Levens, A. S. *Graphics-Analysis and Conceptual Design.* 2nd ed. Wiley.

REFERENCE BOOKS

Beakley, G. C. & Leach, H. W. *Engineering—An Introduction to a Creative Profession.* 2nd ed. Macmillan.

Grant, H. E. *Engineering Drawing with Creative Design.* 2nd ed. McGraw-Hill.

Harrisberger, L. *Engineersmanship—a Philosophy of Design.* Brooks-Cole.

Krick, E. V. *An Introduction to Engineering and Engineering Design.* 2nd ed. Wiley.

EXAMINATION

One two-hour paper on Section (b) at end of course. Section (a) will be assessed by class assignments and a Conceptual Design Project.

Materials I

Second session subject

Atomic theory, stoichiometry and structure; states of matter; energy concepts including bond and lattice energies. Crystalline nature of metals and its significance; solidification of metals; phase equilibria in metallic alloys; heat treatment of some ferrous and non-ferrous alloys; plastic deformation of crystalline materials; introduction to the study of the mechanical properties of metals and non-metals.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One three-hour paper at end of course.

YEAR II

Applied Mechanics II

First session subject

Kinematics of rigid bodies. Dynamics of rigid bodies in plane motion; moments of inertia, equations of motion, dynamic equilibrium; momentum and impulse, energy analysis. Dynamics of simple mechanisms. Introduction to mechanical vibrations.

PRESCRIBED TEXTBOOKS

Beer, F. P. & Johnston, E. R. *Vector Mechanics for Engineers — Dynamics.* McGraw-Hill.

Hirschhorn, J. *Dynamics of Machinery.* Nelson.

REFERENCE BOOKS

Church, A. H. *Mechanical Vibrations.* Wiley.

Meriam, J. L. *Dynamics.* Wiley.

EXAMINATION

One two-hour paper at end of course.

Applied Mechanics III

Second session subject

System classification—ordinary and partial differential equations that commonly occur in engineering problems. Circuit diagrams for mechanical systems; "through" and "across" variables; equilibrium analysis; block diagrams; reduction of equations; concept of state; free and forced response; system functions; stability; sinusoidal response; Fourier Series and Integral; Laplace Transform applied to linear systems.

PRESCRIBED TEXTBOOK

Cannon, R. H. *Dynamics of Physical Systems.* McGraw-Hill.

REFERENCE BOOKS

Churchill, R. V. *Operational Mathematics.* McGraw-Hill.
Haberman, C. M. *Engineering Systems Analysis.* Merrill.
Meriam, J. L. *Dynamics.* Wiley.
Salvadori, M. G. & Schwarz, R. J. *Differential Equations in Engineering Problems.* Prentice-Hall.

EXAMINATION

One two-hour paper at end of course.

Design II

Second session subject

(a) *Machinery:* Permissible stresses; probability of failure and safety factors. Machine elements including shafts, clutches, brakes, springs, power screws and bearings.
(b) *Steel Structures:* Bolted, rivetted and welded connections; simple and built up beams, trusses and columns.

PRESCRIBED TEXTBOOKS

Faires, V. M. *Design of Machine Elements.* Macmillan.
Gorenc, B. E. *Steel Designer's Handbook.* A. & R.
S.A.A. CA1. *Steel Structures*; CA8 *Arc Welding in Building Construction*; CA34 *Loading Code* (Parts I and II); B249 *Design of Shafts for Cranes and Hoists.*

REFERENCE BOOK

Gray, C. S. et al. *Steel Designer's Manual.* Crosby Lockwood.

EXAMINATION

No formal examination. Assessment will be based on drawing office assignments.

Experimental Engineering I

Second session subject

Measuring techniques as applied to temperature, pressure, stress, displacement, velocity, acceleration and fluid flow, under static and dynamic conditions. Sensing elements. Recording instruments and associated equipment. Calibration of instruments. Analyses of experimental results —errors and curve fitting techniques.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

No formal examination. Assessment will be based on laboratory reports all of which are compulsory.

Fluid Mechanics I

First session subject

Review of physical properties of fluids; fluid statics and manometry; continuity and momentum equations; rotation and vorticity; equations of motion; steady flow energy equation; fluid flow measurements.

PRESCRIBED TEXTBOOK

Olson, R. M. *Engineering Fluid Mechanics.* International.

REFERENCE BOOK

Streeter, V. L. *Fluid Mechanics.* McGraw-Hill.

EXAMINATION

One two-hour paper at end of course.

Materials II

Second session subject

Materials in engineering design, including—standard specification and acceptance tests, measurement of fatigue and impact strengths and hardness, notch sensitivity, application of criterions of failure.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

Relevant standards covering specifications and acceptance tests—list provided during course.

EXAMINATION

One two-hour paper at end of course.

Strength of Materials

First session subject

Components of stress and strain; two-dimensional stress systems; torsion of circular shafts; springs; flexure and deflexion of beams; structures; slope deflexion equation; strain energy; frame structures.

PRESCRIBED TEXTBOOK

Hall, A. S. *An Introduction to the Mechanics of Solids.* SI ed. Wiley.

REFERENCE BOOKS

Cernica, J. N. *Strength of Materials.* Holt, Rinehart & Winston.
Higdon, A. et al. *Mechanics of Materials.* 2nd ed. Wiley.
Popov, E. P. *Introduction to Mechanics of Solids.* Prentice-Hall.
Shanley, F. R. *Mechanics of Materials.* McGraw-Hill.
Timoshenko, S. & Young, D. H. *Elements of Strength of Materials.* 4th ed. Van Nostrand.

EXAMINATION

One two-hour paper at end of course.

Thermodynamics I

First session subject

Concepts and definitions. Energy transfer and the first law. Properties and state of a simple substance. Control-mass and control-volume analysis of thermodynamic systems. Quantum and probability considerations and the concept of entropy. The second law and corollaries. Application.

PRESCRIBED TEXTBOOK
Reynolds, W. C. *Thermodynamics.* McGraw-Hill.

REFERENCE BOOKS
Sonntag, R. E. & Van Wylen, G. J. *Introduction to Thermodynamics.* Wiley.
Wark, K. *Thermodynamics.* McGraw-Hill.

EXAMINATION
One two-hour paper at end of course.

YEAR III

Applied Mechanics IV

First session subject

Generalised variables. Modelling of multi degree of freedom lumped systems. Lagrange's equations applied to system modelling. Matrix analysis applied to engineering problems. State space analysis of linear lumped systems. Analysis of distributed systems—solution of Laplace, diffusion and wave equations. Vibrations of strings, bars and membranes. Transverse vibrations of beams.

PRESCRIBED TEXTBOOK
Cannon, R. H. *Dynamics of Physical Systems.* McGraw-Hill.

REFERENCE BOOKS
Haberman, C. M. *Engineering Systems Analysis.* Merrill.
Housner, G. W. & Hudson, D. E. *Applied Mechanics, Dynamics.* 2nd ed. Van Nostrand.
Raven, F. H. *Mathematics of Engineering Systems.* McGraw-Hill.

EXAMINATION
One two-hour paper at end of course.

Applied Mechanics V

Second session subject

(i) *Statistical Methods:* Probability theory, probability density and distribution functions. Discrete and continuous data. Regression analysis. Analysis of variance. Correlation analysis. Goodness of fit tests.
(ii) *Numerical methods:* Numerical solution of differential equations. Roots of algebraic equations.

PRESCRIBED TEXTBOOK
To be advised.

REFERENCE BOOKS
To be advised during course.

EXAMINATION
One two-hour paper at end of course.

Control Systems I

First session subject

Principles and techniques applicable to the analysis and design of feedback control systems with particular application to industrial processes. Modelling of control systems. Basic control actions, time domain and frequency domain analysis of linear systems, stability analysis, Nyquist Criterion, Bode Diagrams, Nichols Charts. Analogue computers.

PRESCRIBED TEXTBOOK

Ogata, K. *Modern Control Engineering.* Prentice-Hall.

REFERENCE BOOKS

Dransfield, P. *Engineering Systems and Automatic Control.* Prentice-Hall.

Harrison, H. L. & Bolinger, J. G. *Introduction to Automatic Controls.* 2nd ed. International.

Kuo, B. C. *Automatic Control Systems.* Prentice-Hall.

Raven, F. H. *Automatic Control Engineering.* 2nd ed. McGraw-Hill.

EXAMINATION

One two-hour paper at end of course.

Control Systems II

Second session subject

Further methods applied to the analysis and design of feedback control sytems. Root locus analysis. State space analysis of linear systems. Design and compensation techniques. Introduction to non linear systems and techniques of analysis. Liapunov stability analysis. Introduction to optimal control theory.

PRESCRIBED TEXTBOOK

Ogata, K. *Modern Control Engineering.* Prentice-Hall.

REFERENCE BOOKS

De Russo, P. M. et al. *State Variables for Engineers.* Wiley.

Gupta, S. C. & Hasdorf, L. *Fundamentals of Automatic Control.* Wiley.

Kuo, B. C. *Automatic Control Engineering.* Prentice-Hall.

Ogata, K. *State Space Analysis of Control Systems.* Prentice-Hall.

EXAMINATION

One two-hour paper at end of course.

Design III

First session subject

(i) *Experimental methods:* The application of models and analog methods in design for both static and dynamic loadings; to include photoelastic, Moire and strain gauge techniques.

(ii) *Optimization and computers:* The application of computers to design; computer simulation and optimizing techniques.

(iii) *Concrete structures:* Reinforced concrete elements, including slabs, beams, columns and foundations.

PRESCRIBED TEXTBOOKS

C. & C.A. *Australian Reinforced Concrete Design Handbook.*

S.A.A. CA2 *Concrete in Buildings*; CA34 *Loading Code* (Parts 1 & 2).

REFERENCE BOOK

Zienkiewicz, O. C. & Hollister, G. S. *Stress Analysis.* Wiley.

EXAMINATION

No formal examination. Assessment will be based on drawing office assignments.

Design IV

Second session subject

Either

Design A (Process and industrial machinery)

Topics covered are selected from the following areas:
Rolling mills, air pollution control equipment, internal combustion engines, pumping equipment, blowers and compressors.

or

Design B

(i) *Steel structures:* Design of portal frames and mill buildings. Introduction to plastic design. Selected topics will be considered from the following areas: suspension and continuous girder bridges; transmission towers and guyed structures.

(ii) *Concrete structures:* Further design of concrete columns and continuous slabs. Design of pre and post stressed concrete structures.

In both Design A and Design B, the design and preparation of working drawings for selected topics will be required.

PRESCRIBED TEXTBOOKS

Design A

Nil.

Design B

Cowan, H. J. & Smith, P. R. *The Design of Reinforced Concrete.* A. & R. Gray, C. S. et al. *Steel Designer's Manual.* Crosby Lockwood.
S.A.A. *CA1 Steel Structures*; *CA2 Concrete in Buildings*; *CA8 Arc Welding in Building Construction*; *CA34 Loading Code (Parts* 1 & 2); *CA35 Prestressed concrete*; *CA45 High Strength Bolting.*

REFERENCE BOOKS

Design A and Design B

To be advised during course, depending on projects undertaken.

EXAMINATION

No formal examination. Assessment will be based on drawing office assignments.

Experimental Engineering II

Second session subject

Testing of reciprocating and rotodynamic machines: refrigeration plant nozzles; heat exchangers.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

No formal examinations. Assessment will be based on laboratory reports all of which are compulsory.

Fluid Mechanics II

First session subject

Dimensional analysis. Dynamic similarity. Modelling. Boundary layer theory. Dynamic drag and lift. Flow of real fluids in ducts. Pipe networks. Theory of turbomachinery. Performance characteristics.

PRESCRIBED TEXTBOOK

Olson, R. M. *Engineering Fluid Mechanics.* International.

REFERENCE BOOKS

Shepherd, D. G. *Elements of Fluid Mechanics.* Harcourt, Brace & World.

EXAMINATION

One two-hour paper at end of course.

Fluid Mechanics III

Second session subject

Students must take either Part A or Part B of this subject.

(A) One dimensional compressible fluid flow. Isentropic variable area flow. Nozzles and diffusers. Normal and oblique shocks. Effects of friction and heat transfer. Shapiro-Hawthorne generalised analysis. Boundary layer theory. Equations of motion. Exact solutions for laminar flow. Turbulent flow and parameters. Universal velocity distribution. Resistance formulae for ducts. Boundary layers with pressure gradient. Separation and vortex formation. Boundary layer control. Drag and pressure distribution relationships for bluff bodies.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

Schlichting, H. & Kestin, J. *Boundary Layer Theory.* McGraw-Hill.
Shapiro, A. H. *The Dynamics and Thermodynamics of Compressible Fluid Flow.* Vol. 1. Ronald.

EXAMINATION

One two-hour paper at end of course.

(B) Open channel hydraulics. Hydrology. Weather and hydrology. Precipitation. Stream flow. Evaporation and transpiration. Groundwater. Hydrograph analysis. Runoff relations. Hydrographs of runoff.

PRESCRIBED TEXTBOOK

Linsley, R. K. et al. *Hydrology for Engineers.* McGraw-Hill.

REFERENCE BOOKS

Chow, V. T. *Handbook of Applied Hydrology.* McGraw-Hill.
Linsley, R. K. et al. *Applied Hydrology.* McGraw-Hill.
Todd, D. K. *Groundwater Hydrology.* Wiley.
Wisler, C. O. & Brater, E. F. *Hydrology.* Wiley.

EXAMINATION

One two-hour paper at end of course.

Heat Transfer

Second session subject

One and two-dimensional steady state conduction; free and forced convection; radiation; combined heat transfer mechanics and applications.

PRESCRIBED TEXTBOOK

Holman, J. P. *Heat Transfer.* 2nd ed. McGraw-Hill.

REFERENCE BOOKS

Chapman, A. J. *Heat Transfer.* 2nd ed. Macmillan.
Kreith, F. *Principles of Heat Transfer.* 2nd ed. International.

EXAMINATION

One two-hour paper at end of course.

Materials III

Second session subject

Mechanical behaviour of materials; non-destructive test procedures; concrete technology.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One two-hour paper at end of course.

Soil Mechanics I

First session subject

Principal types of soil. Mechanical analysis and index properties of soils. Consistency and sensitivity of clays. Permeability. Effective and neutral stresses. Compressibility of clay layers. Settlement computation. Precompression and its influence on settlement. Stress-strain behaviour of sands and clay. Shearing resistance and conditions of failure for soils. Use of Mohr's diagram. Capillary phenomena. Desiccation of soil. Governing differential equation for steady seepage through soil. Flow nets and computation of quantity of seepage. Mechanics of piping. Introduction to theory of one-dimensional consolidation. Stability of slopes. $\Phi = 0$ analysis and its relevance to real problems. The friction circle method. The method of slices.

PRESCRIBED TEXTBOOKS

Lambe, T. W. *Soil Testing for Engineers.* Wiley.
Lambe, T. W. & Whitman, R. V. *Soil Mechanics.* Wiley.
Terzaghi, K. & Peck, R. B. *Soil Mechanics in Engineering Practice.* Wiley.

REFERENCE BOOKS

Harr, M. E. *Foundations of Theoretical Soil Mechanics.* McGraw-Hill.
Taylor, D. W. *Fundamental of Soil Mechanics.* Wiley

EXAMINATION

One two-hour paper at end of course.

Structures I

First session subject

Analysis of statically indeterminate structures; shells; plastic analysis of steel structures; introduction to two-dimensional elasticity; approximate methods.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One three-hour paper at end of course.

Surveying I

First session subject

Linear measurements, chain surveying; levelling; measurement of angles; traverse surveys and computations; horizontal and vertical curves.

PRESCRIBED TEXTBOOKS

Bannister, A. & Raymond, S. *Surveying.* Pitman.
Seven Figure Mathematical Tables. Chambers.

REFERENCE BOOKS

Clark, D. *Plane and Geodetic Surveying.* Vol. 1. 6th ed. Constable.
Bouchard, H. & Moffitt, F. H. *Surveying.* 5th ed. International.
Sandover, J. A. *Plane Surveying.* Arnold.
Whyte, W. S. *Basic Metric Surveying.* Butterworth.

EXAMINATION

One two-hour paper at end of course and assignments.

Surveying II

Second session subject

Indirect measurements of distance, electronic methods; topographic surveys, tacheometry, plane tabling; photogrammetry, radial line plotting, stereoscopy; earthwork calculations.

PRESCRIBED TEXTBOOKS

As for *Surveying I.*

REFERENCE BOOKS

Manual of Photogrammetry. 3rd ed. Am. Soc. Photogram.
Moffitt, F. H. *Photogrammetry.* 2nd ed. International.

EXAMINATION

One two-hour paper at end of course and assignments.

Thermodynamics II

First session subject

Equations of state. Property relations. Gas mixtures. Compressibility charts. Psychometry. Vapour and gas power cycles. Heat pumps and refrigerators. Rotodynamic machines.

PRESCRIBED TEXTBOOKS

Reynolds, W. C. *Thermodynamics.* 2nd ed. McGraw-Hill.
or
Wark, K. *Thermodynamics.* 2nd ed. McGraw-Hill.

REFERENCE BOOKS

Jones, J. B. & Hawkins, G. A. *Engineering Thermodynamics.* Wiley.
Shepherd, D. *Introduction to the Gas Turbine.* 2nd ed. Van Nostrand.
Sonntag, R. E. & Van Wylen, G. J. *Introduction to Thermodynamics.* Wiley.

EXAMINATION

One two-hour paper at end of course.

YEAR IV

Applied Dynamics I

First session subject

Kinematics of particles and rigid bodies in three dimensions. Three dimensional dynamics of rigid bodies; inertia tensor; Euler's equations of motion. Relativistic dynamics. Dynamic analysis of mechanisms.

PRESCRIBED TEXTBOOKS

Hirschhorn, J. *Kinematics and Dynamics of Plane Mechanisms.* McGraw-Hill.
Huang, T. C. *Engineering Mechanics—Dynamics.* Addison-Wesley.

REFERENCE BOOKS

Holowenko, A. R. *Dynamics of Machinery.* Wiley.
Housner, G. W. & Hudson, D. E. *Applied Mechanics, Dynamics.* Van Nostrand.
Mabie, H. H. & Ocvirk, F. W. *Mechanisms and Dynamics of Machinery.* Wiley.
McCuskey, S. W. *Introduction to Advanced Dynamics.* Addison-Wesley.
Smith, G. M. & Downey, G. L. *Advanced Dynamics for Engineers.* International.

EXAMINATION

One two-hour paper at end of course.

Applied Dynamics II

Second session subject

Lagrangian Dynamics and Hamilton's Principle applied to particles and rigid bodies; holonomic and non holonomic constraints; dynamics of continuous systems; introduction to statistical mechanics.

PRESCRIBED TEXTBOOK

To be advised.

REFERENCE BOOKS

Crandall, S. H. et al. *Dynamics of Mechanical and Electro-Mechanical Systems.* McGraw-Hill.
Housner, G. W. & Hudson, D. E. *Applied Mechanics, Dynamics.* Van Nostrand.
McCuskey, S. W. *Introduction to Advanced Dynamics.* Addison-Wesley.

EXAMINATION

One two-hour paper at end of course.

Engineering Management I

First session subject

Theory and practice of organisation and industry; general principles of law of contract.

PRESCRIBED TEXTBOOK

To be advised.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

Assessment will be based on class examinations held during course.

Engineering Management II

Second session subject

Industrial relations. Introduction to cost accounting.

PRESCRIBED TEXTBOOK

To be advised.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

Assessment will be based on class examinations held during course.

Fluid Mechanics IV

Second session subject

Potential flow of incompressible fluids in two dimensions. Flow nets. Standard patterns of flow. Method of superposition. Conformal transformations in the complex plane.

Introduction to two-dimensional flow of compressible fluids. Subsonic flow with small perturbations. Gothert's similarity law. Prandtl-Glauert rule. Mach number effects.

Thermodynamics of turbomachine processes. Stage efficiencies. Design considerations. Cavitation. Cascade mechanics. Thin airfoil theory.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

Csanady, G. *Theory of Turbomachines.* McGraw-Hill.
Pao, R. H. F. *Fluid Dynamics.* Merrill.
Vallentine, H. R. *Applied Hydro-dynamics.* Butterworths.

EXAMINATION

One two-hour paper at end of course.

Geology for Engineers

Second session subject

Rock forming minerals, clay minerals; rock classification and properties; structural geology; groundwater; application of geology and geophysics in engineering practice.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One two-hour examination at end of course.

Materials IV

First session subject

Further work on mechanical behaviour of metals and non-metals; behaviour of materials in electromagnetic fields; metallic and ceramic phases and their properties; equilibrium diagrams.

PRESCRIBED TEXTBOOK
Nil.

REFERENCE BOOKS
To be advised during the course

EXAMINATION
One three-hour paper at end of course.

Materials Handling Systems I

First session subject

Principles of granular mechanics; packings; flow patterns and properties; measurement of flow properties in relation to Hopper design; stress analysis of bulk solids and determination of Hopper configurations.

PRESCRIBED TEXTBOOK
Nil.

REFERENCE BOOKS
Brown, R. L. & Richards, J. C. *Principles of Powder Mechanics.* Pergamon.
Jenike, A. W. *Gravity Flow of Bulk Solids.* Bul. 108. Utah Engineering Experiment Station 1961.
Jenike, A. W. *Storage and Flow of Solids.* Bul. 123. Utah Engineering Experiment Station 1964.
Mohsenin, N. N. *Physical Properties of Plant and Animal Materials.* Gordon Breach.

EXAMINATION
One two-hour examination at end of course.

Materials Handling Systems II

Second session subject

Design and performance of conveyor systems; forced and free flow of granular materials. Two phase flow; system identification and optimization applied to bulk handling systems.

PRESCRIBED TEXTBOOK
Nil.

REFERENCE BOOKS
Selected research papers.

EXAMINATION
One two-hour paper at end of course.

Nuclear Power Technology I

First session subject

Nuclear processes, fission and energy deposition, nuclear reaction rates, fuel cycles and nuclear reactor types. Primary and secondary radiation sources, multiplication slowing down and diffusion of neutrons, criticality conditions and reactivity changes with burnup. Fine scale flux in fuel element lattices, effects of control rods and reflectors. Delayed neutrons, point reactor neutron kinetics, and reactor control.

PRESCRIBED TEXTBOOK
Nil.

REFERENCE BOOKS
To be advised during course.

EXAMINATION
One two-hour paper at end of course.

Nuclear Power Technology II

Second session subject

Heat conduction, transfer and transport in canned reactor fuel elements and reactor coolant channels. Gas, non-metallic fluid and liquid metal cooling. Boiling, two phase flow and burnout problem. Void, temperature and fission product power reactivity feedback mechanisms. Thermo-mechanical aspects of reactor core performance.

The thermodynamics of nuclear power systems. The special nuclear, thermal and cost characteristics of gas cooled, pressurized water, boiling water and liquid metal fast reactor systems. Isotopic power generators, process heat and other reactor applications.

PRESCRIBED TEXTBOOK
Nil.

REFERENCE BOOKS
To be advised during course.

EXAMINATION
One two-hour paper at end of course.

Public Health Engineering

Second session subject

Process of decomposition or decay; chemical and biochemical measurements, basic principles of the treatment of polluted waters. Water supply schemes; principles and practice of water treatment; sewage systems, sewage treatment and disposal; refuse disposal.

PRESCRIBED TEXTBOOK
Nil.

REFERENCE BOOKS
To be advised during course.

EXAMINATION
Assessment will be based on class examinations held during course.

Roads Engineering

First session subject

Road location and surveys, road design standards, types and functions of pavements, construction methods, earthworks and earth moving machinery. Construction planning and scheduling. Road drainage requirements. Economic analysis and costing. Transport systems and communication networks.

PRESCRIBED TEXTBOOK
Nil.

REFERENCE BOOKS
To be advised during course.

EXAMINATION
Assessment will be based on class examinations held during course.

Soil Mechanics II

Second session subject

Determination of soil properties. Measurement of soil strength. Plastic equilibrium in soils. Rankine and Coulomb Theories of Earth Pressure. Bearing capacity of shallow footings, piers and piles. Earth Pressure against bracing in cuts. Stresses beneath loaded areas. Application of the theory of elasticity. Design of footings, rafts and pile foundations. Sheet piles and analysis for stability. Soil stabilisation. Soil exploration.

PRESCRIBED TEXTBOOKS

Lambe, T. W. *Soil Testing for Engineers.* Wiley.
Terzaghi, K. *Theoretical Soil Mechanics.* Wiley.
Terzaghi, K. & Peck, R. B. *Soil Mechanics in Engineering Practice.* Wiley.

REFERENCE BOOKS

Bishop, A. W. & Henkel, D. J. *Measurement of Soil Properties in the Triaxial Test.* Arnold.
Scott, R. F. *Principles of Soil Mechanics.* Addison-Wesley.
Soil Mechanics for Road Engineers. HMSO.
Tschebotarioff, G. P. *Soil Mechanics, Foundations and Earth Structures.* McGraw-Hill.
Wu, T. H. *Soil Mechanics.* Allyn & Bacon.

EXAMINATION

One three-hour paper at end of course.

Structures II

First session subject

Experimental structural analysis: indirect and direct model analysis. Structural similitude. Limit analysis of steel structures.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One two-hour paper at end of course.

Structures III

Second session subject

Topics will include the following: Stiffness and flexibility methods of analysis of indeterminate structures; dynamics of structures; shells; finite element analysis; variational principles.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One two-hour paper at end of course.

Systems Analysis I

First session subject

Linear programming; network analysis; dynamic programming; queueing theory.

PRESCRIBED TEXTBOOK

Hillier, F. S. & Lieberman, G. J. *Introduction to Operations Research.* Holden-Day.

REFERENCE BOOKS

Riggs, J. L. *Economic Decision Models.* McGraw-Hill.

Rosenbrock, H. & Storey, S. *Computational Techniques for Chemical Engineers.* Pergamon.

Wagner, H. M. *Principles of Operations Research.* Prentice-Hall.

EXAMINATION

One two-hour paper at end of course.

Systems Analysis II

Second session subject

System optimization; variational methods; random data analysis; signal theory; stochastic processes.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

To be advised during course.

EXAMINATION

One two-hour paper at end of course.

Systems Analysis III

First session subject

Classical and frequency domain solution of lumped, varying and distributed systems. Difference equations—classical solution; application of Z-transforms. Application of complex variable theory to the solution of engineering problems—conformal mapping. Phase plane analysis. Further state variable analysis and numerical methods applied to the solution of state equations.

PRESCRIBED TEXTBOOK

Wiley, C. R. *Advanced Engineering Mathematics.* McGraw-Hill.

REFERENCE BOOKS

De Russo, P. M. et al. *State Variables for Engineers.* Wiley.

Jury, E. I. *Theory and Practice of the Z-Transform.* Wiley.

MacFarlane, A. J. G. *Engineering Systems Analysis.* Addison-Wesley.

Pipes, L. A. *Matrix Methods for Engineering.* Prentice-Hall.

EXAMINATION

One two-hour paper at end of course.

Thermodynamics III

First session subject

Property relations—Jacobians. Thermographics. Availability and irreversibility. Statistical thermodynamics; Maxwell-Botlzman, Fermi-Dirac and Bose-Einstein statistics; partition function and relation to macroscopic properties of ideal gases. Irreversible processes; coupled flows and phenomenological relations; Thermomechanical and thermoelectric effects. Combustion and thermiochemistry. Chemical equilibrium.

PRESCRIBED TEXTBOOK

Nil.

REFERENCE BOOKS

Badger, P. H. *Equilibrium Thermodynamics.* Allyn & Bacon.
Crawford, F. H. & Van Vorst, W. D. *Thermodynamics for Engineers.* Harcourt Brace & World.
Kestin, J. *A Course in Thermodynamics.* Vol. 1 & 2. Blaisdell.
Sonntag, R. E. & Van Wylen, G. J. *Fundamentals of Statistical Thermodynamics.* Wiley.
Tribus, M. *Thermostatics and Thermodynamics.* Van Nostrand.
Wark, K. *Thermodynamics.* McGraw-Hill.

EXAMINATION

One two-hour paper at end of course.

The following is for the Metallurgy Course only:

Design M

Double session subject

Moving loads; influence llnes for beams; permissible stresses; design of welded plate web girder; project.

The following are for the Mining Engineering Course only:

Geology for Engineers

Double session subject

Basic geology and engineering geology for Civil Engineering students. Geology: The geochemistry and structure of the earth. Rock-forming minerals and the classification of rocks. Clay minerals and their engineering properties. Elementary stratigraphy and structural geology. The mineralogy, lithology, and formation of igneous, sedimentary and metamorphic rocks. The denudation and weathering of rocks with particular reference to the nature of residual and transported soils. The nature of residual and transported soils. The nature and occurrence of groundwater. Engineering Geology: Review of the application of geology in engineering practice. Geophysics methods utilized in sub-surface exploration. The mechanical properties of the main rock types. Chemical instability of rock as affecting foundations and aggregates. Mass movement and the stability of slopes. The structural analysis of discontinuities in rock masses and its application to the study of failure in dams, tunnels, open-cut excavations and other engineering works. Engineering geology report writing as utilized in dam and reservoir investigations, nuclear facilities, hydrogeological investigations. Laboratory: The identification of common rock-forming minerals and rock types. The examination of rocks in the hand specimen to establish their relative strength, resistance to abrasion and chemical stability. The preparation and interpretation of geological maps and sections.

Mining Engineering I

Double session subject

Part 1: Development patterns and techniques for mineral deposits. Size and frequency of levels and other openings. Drilling equipment and techniques. Explosive cratering and fracture of rock. Shaft sinking, layout, equipment and techniques. Tunnelling equipment and techniques. Support of development excavations, temporary, stabilizing and long term. Mining applied to civil engineering projects.

Part 2: Advanced mining systems. Analysis of mining methods and graphical models of mining methods. Surface methods: quarries, open cuts, dredging. Coal: horizon, room and pillar, long wall. Metals: open stoping, shrinkage, cut and fill square set, caving. Non-entry: leaching in situ, salt, sulphur, gas, petroleum, underground gasification. Parameters for efficiency in mining techniques. Grade control and blending. Mine filling, pillars.

Mining and Mineral Process Engineering

Double session subject

Part 1: Mining Engineering: An introduction to mining engineering. Definitions, principles, types of mineral deposits, principles of mine and quarry development. Classification of mining extraction methods, applications to coal, non-metallic and metalliferous deposits. Petroleum production engineering. Sea floor mining. Tutorial exercises and demonstrations.

Part 2: Mineral Process Engineering: Liberation, comminution, size analysis, gravity, magnetic, electrostatic separation. Froth flotation. Chemical extraction. Materials handling, dewatering. Process design, flow sheets. Mineral economics. Marketing of mineral products, smelter schedules. Tutorial exercises and demonstrations.

Engineering Surveying

Double session subject

Part A: Ordinary levelling. Angle measurement. Linear measurement (tapes). Theodolite traversing. Tachometry. Contour and detail surveys. Areas and volumes.

Part B: Levelling (other methods). Linear measurement (electronic). Applications of survey techniques; control surveys, provision of information for design, setting out engineering works, etc. Outline of photogrammetry.

Geology for Mining Engineers

Double session subject

Occurrence and structures of igneous rocks, consolidation of magmas, igneous rock classification. Thermal and regional metamorphism. Composition and classification of sedimentary rocks—sedimentary environment. Ore genesis, synmagmatic, epimagmatic and post-magmatic processes, volcanic exhalative deposits, sedimentary biogenetic deposits. Structural control of ore deposits. Alluvial deposits, non-metallic ores. Nature, origin and occurrence of coal and petroleum. Type and rank variation, coal petrology, coalfield geology. Geological evolution of the Australian continent from Pre-Cambrian to Recent times. Introductory geophysics—methods and applications. Laboratory: macroscopic and microscopic study of rocks and minerals. Ore mineralogy and mineragraphy. Coal petrology. Study of more common plant and animal fossils. Stratigraphic and other forms of geological mapping.

Mining Engineering II

Double session subject

Mining atmosphere, gas, dust, spontaneous combustion, explosions, fires, mine rescue and recovery organization. Mine ventilation properties of mine air fans, air flow, shock losses, thermodynamics. Transport of materials, flow of bulk solids, chute and storage design, conveyors, tracked and trackless transport, head frames, shaft conveyances, wire ropes, oil and slurry pipe lines. State of stress in earth's crust, subsidence, strata control, rock bursts, physical properties of rocks.

Mining tectonics and rock mechanics. Power supply and transmission. Mine drainage, pumps, pump stations, flooding and dewatering, removal of fluid from porous strata. Mine safety engineering, health, hygiene, diseases. Noise. Signalling. Principles of mine lighting. Compressed air generation and reticulation.

Mineral Processing I

Double session subject

Applied mineralogy, assessment of physical and chemical properties, liberation, process design. Theory of particle breakage, comminution technology of crushing and grinding, particle size distribution and analysis. Gravity concentration and other physical methods of separation. Froth flotation. Fluid mechanics of mineral pulps, free, hindered and zone settling, thickening, classification, dewatering.

Mine Surveying and Control Engineering

Double session subject

Surveying techniques in the development and exploitation of mineral resources and the assessment of mineral properties. Tunnel surveys; transfer of azimuth; bore hole surveying; stope and ore reserves surveys; special mine surveys; mine survey office organization. Stereographic projection. Organization and programming of mining methods or techniques. Method of production control and grade control. Mathematical models of mining methods.

Mineral Industry Elective Project

Double session subject

Elective may include mineral process engineering; statistics; sampling and valuation; rock mechanics; mine and treatment plant design; minerals and petroleum production engineering; selected courses from other Schools.

ECONOMICS

All subjects require three class hours per week.

Economics I

First session subject

A general introduction to the study of Economics. Emphasis will be placed on:

1. Differences between economic systems.
2. The structure of the Australian economy.
3. Economic analysis and its application in the study of the micro-unit in an exchange system.

REFERENCE BOOKS

Gill, R. T. *Economics.* Goodyear, 1973.
Grossman, G. *Economic Systems.* Prentice-Hall, 1967.
Hannaford, J. *Students' Guide to "The Economic Problem".* Prentice-Hall.
Heilbroner, R. L. *The Economic Problem.* Prentice-Hall, 1972.

Economics II

Second session subject

This subject continues the general introduction to the discipline, extending it to the analysis of the macro-unit, economic growth and international economics, and leads to the study of some central problems of Australian economic policy.

REFERENCE BOOKS

As for *Economics I,* plus:
Arndt, H. W. *A Small Rich Industrial Economy.* Cheshire, 1968.

Microeconomics III

First session subject

Theory of consumer demand: utility, indifference curve analysis, elasticity; theory of production: production functions, stages of production, law of diminishing marginal returns, returns to scale; theory of costs; isoquants and Isocosts, optimum factor combinations, nature and type of costs; prices and output in perfect competition: resource allocation and economic efficiency, short run and long run equilibrium; price and output in imperfect competition: monopoly, price discrimination, monopolistic competition; theory of factor pricing: demand for factors, supply of factors, economic rent, equilibrium in factor markets; economic interdependence: general and partial equllibrium, input-output analysis.

REFERENCE BOOKS

Breit, W. & Hochman, H. *Readings in Microeconomics.* Holt, Rinehart & Winston, 1971.
Kamerschen, D. *Readings in Microeconomics.* Wiley, 1968.
Mansfield, E. *Microeconomics Theory & Applications.* Norton, 1970.
Mansfield, E. *Microeconomics—Selected Readings.* Norton, 1971.

Microeconomics III Honours

First session subject

This subject covers the same ground as the pass course, but in more depth. Extra reading and assignments will be required.

Microeconomics IV

Second session subject

Prices in oligopoly: kinked demand curve, price leadership, limit pricing and barriers to entry, marginal cost pricing, full cost pricing; goals of oligopolists: profit maximization, sales maximization, growth maximization, alternatives to maximization; implications of market structure, concentration, size of firms, non-price competition, restrictive trade practices, countervailing power, research and development, uncertainty and interdependence; growth of firms: diversification, mergers, zones of stability; economic progress: dynamic v. static performance, sources of growth, innovation, planning, and technological change.

REFERENCE BOOKS

Caves, R. *American Industry—Structure, Conduct and Performance.* Prentice-Hall, 1972.
Galbraith, J. K. *The New Industrial State.* Penguin, 1969.
Gilbert, M. ed. *The Modern Business Enterprise.* Penguin, 1973.
George, K. *Industrial Organization.* Allen & Unwin, 1971.
Mansfield, E. *Monopoly Power and Economic Performance.* Rev. ed. Norton, 1968.
Mermelstein, D. *Economics—Mainstream Readings and Radical Critiques.* Random House, 1972.
Townsend, H. *Scale, Innovation Merger and Monopoly.* Pergamon, 1968.
Utton, M. *Industrial Concentration. Penguin,* 1970.

Microeconomics IV Honours

Second session subject

This subject covers the same ground as the pass course, but in more depth. Extra reading and assignments will be required.

Macroeconomics III

First session subject

A basic study of theoretical macroeconomics concerned with: interactions between markets for money, products and labour; theories of investment and interest rates; the multiplier and its empirical applications; internal and external balance; theories of inflation; and theories of business cycles and economic growth.

REFERENCE BOOK

Shapiro, E. *Macroeconomic Analysis.* 2nd ed. Harcourt, Brace & World, 1970.

SUPPLEMENTARY REFERENCES

Barrett, N. S. *The Theory of Macroeconomic Policy.* Prentice-Hall, 1973.
Nevile, J. W. & Stammer, P. W. eds. *Inflation and Unemployment.* Penguin. 1972.
Peterson, W. *Income, Employment and Economic Growth.* Rev. ed. Norton, 1967.

Macroeconomics III Honours

First session subject

This includes *Macroeconomics III* plus additional reading and assignments.

Macroeconomics IV

Second session subject

A study in the application of basic macroeconomic theories, principally concerned with the Australian economy. It includes the analysis of the Australian national accounts, input-output relations, and the flow-of-funds accounts; intertemporal and international comparisons of real income; the national debt and debt management; monetary theory; and money, banking and the capital market of Australia.

REFERENCE BOOKS

Abraham, W. *National Income and Economic Accounting.* Prentice-Hall, 1971.
Friedman, M. *Dollars and Deficits.* Prentice-Hall, 1968.
Nevile, J. W. *Fiscal Policy in Australia.* Cheshire, 1970.
Pechman, J. A. *Federal Tax Policy.* Rev. ed. Norton, 1971.

Macroeconomics IV Honours

Second session subject

This includes *Macroeconomics IV* plus additional reading and assignments.

Statistical Methods I

First session subject

Basic concepts: tabular and graphical methods of presenting data; frequency distributions: their formation and types; measures of central tendency, dispersion and skewness; probability: discrete and continuous; laws of probability, probability distributions, expectations, random variables; testing hypotheses, formation of hypotheses, measures of reliability and significance; standard error, confidence limits, Type I and Type II errors, goodness of fit.

REFERENCE BOOK

Summers, G. W. & Peters, W. S. *Basic Statistics in Business and Economics.* Wadsworth Publishing Company, 1973.

SUPPLEMENTARY REFERENCES

L'Esperance, W. L. *Modern Statistics for Business and Economics.* Collier-Macmillan, 1971.
Hamburg, M. *Statistical Analysis for Decision Making.* Harcourt, Brace & World, 1970.
Shao, S. P. *Statistics for Business and Economics.* Merrill Publishing Co., 1972.
Yeomans, K. A. *Statistics for the Social Scientist.* Vols. 1 & 2. Penguin, 1971.

Statistical Methods II

Second session subject

Simple regression analysis, scatter diagrams, analysis of variance, correlation co-efficients; index numbers: concept, types, index number construction, index numbers in practice; time series analysis: components of time series, trend line, moving average; sampling: population and samples, size of sample, stratified sampling, practical problems.

REFERENCE BOOKS

As for *Statistical Methods I.*

SUPPLEMENTARY REFERENCES

Karmel, P. H. & Polasek, M. *Applied Statistics for Economists*. Pitman, 1970.

Yamane, T. *Statistics—An Introductory Analysis*. Harper & Row, 1967.

Yeomans, K. A. *Statistics for the Social Scientist*. Vols. 1 & 2. Penguin, 1971.

Quantitative Methods III

First session subject

Introduction to research methods and procedures. Multiple regression analysis: theory, economic applications, problems in empirical regression analysis. Introduction to decision theory: inventory problems, replacement problems.

REFERENCE BOOKS

Select one of the following:

Aigner, D. J. *Basic Econometrics*. Prentice-Hall, 1971.

Kmenta, J. *Elements of Econometricts*. Collier-Macmillan, 1971.

Wonnacott, R. J. & Wonnacott, T. H. *Econometrics*. Wiley, 1970.

SUPPLEMENTARY REFERENCES

Huang, D. S. *Regression and Econometric Method*. Wiley, 1970.

Klein, L. R. *An Introduction to Econometrics*. Prentice-Hall.

Simon, J. L. *Basic Research Methods in Social Science*. Random House, 1969.

Walters, A. *An Introduction to Econometrics*. Macmillan, 1968.

Quantitative Methods IV

Second session subject

Input-output analysis: theory, economic applications; linear programming: theory, economic applications, relation to various types of allocation problems.

REFERENCE BOOKS

Throsby, C. D. *Elementary Linear Programming*. Random House, 1970.

Yan, Chiou-Shuang. *Introduction to Input-Output Economics*. Holt, Rinehart & Winston, 1969.

SUPPLEMENTARY REFERENCES

Dorfman, R., Samuelson, P. A. & Solow, R. M. *Linear Programming and Economic Analysis*. McGraw-Hill, 1958.

Isard, W. et al. *Methods of Regional Analysis: An Introduction to Regional Science*. Wiley, 1960.

Preston, M. H. *Elementary Matrices for Economics*. Routledge & Kegan Paul, 1969.

International Economics

First session subject

Structure and pattern of international trade and income levels. Analysis of resource allocation: comparative advantage, Heckscher-Ohlin model, rent-for-surplus theory; gains from trade: welfare arguments; growth in factors of production: Rybczynski theorem; technical progress; transfer of capital, technology and labour; tariff policy: optimum tariff, tariff structure and rates, tariff v. subsidy; balance of payments policy: elasticity and absorption approach, exchange rates, quantitative controls; internal and external balance; trends in trade, investment, and finance:

institutions, trade and investment policies, economic integration, international monetary developments. Australian international economic relations will be studied.

REFERENCE BOOKS

Bhagwati, J. ed. *International Trade*. Penguin, 1969.
Grubel, H. G. *The International Monetary System*. Penguin, 1970.
Snape, R. H. *International Trade and the Australian Economy*. Longmans, 1969.
Sodersten, B. *International Economics*. Harper & Row, 1970.

SUPPLEMENTARY REFERENCES

Balassa, B. A. *Changing Patterns in Foreign Trade and Payments*. Norton, 1964.
Harrod, R. & Hague, D. eds. *International Trade Theory in a Developing World*. Macmillan, 1963.
Johnson, H. G. *Economic Policies Towards Less Developed Countries*. Brookings, 1967.

Comparative Economic Systems

First session subject

Classification of economic systems. A priori arguments about the relative efficiency and non-economic implications of centralised and decentralised economic systems. The structure, conduct and performance of the Soviet, Yugoslav, Japanese and French economies.

REFERENCE BOOKS

Felker, J. *Soviet Economic Controversies*. M.I.T. Press, Cambridge Mass., 1966.
Goldman, M. *Comparative Economic Systems—A Reader*. 2nd ed. Random House, N.Y., 1971.
Pejovich, S. *The Market—Planned Economy of Yugoslavia*. Minnesota U.P., 1966.
Sherman, H. *The Soviet Economy*. Little, Brown & Co., Boston, 1969.

SUPPLEMENTARY REFERENCES

Hackett, J. *Economic Planning in France*. Allen & Unwin, London, 1963.
Hayek, F. *Collectivist Economic Planning*. Routledge & Kegan Paul, London, 1956.
Kolaja, J. *Workers Councils: the Yugoslav Experience*. Tavistock, London, 1965.
Lange, O. *On the Economic Theory of Socialism*. McGraw-Hill, N.Y., 1964.
Maddison, A. *Economic Growth in Japan and the U.S.S.R.* Allen & Unwin, London, 1969.
Pigou, A. *Socialism v. Capitalism*. Macmillan, London, 1964.
Sharpe, M. *The Liberman Discussion: A New Phase in Soviet Economic Thought*. International Arts & Science Press, White Plains, N.Y., 1966.
Sturmthal, A. *Workers Councils: A Study of Workplace Organization on Both Sides of the Iron Curtain*. Harvard U.P., Cambridge, Mass., 1964.

Natural Resource Economics

First session subject

A study of the role of natural resources in the economic process and of the problems associated with the use and development of natural resources. Reference will be made to current problems in resource use. Topics to be studied include: definition and classification of natural

resources, their social significance; how natural resources become involved in the economic process, the theory of property rights, the role of property; the use of natural resources by individuals and by society; natural resources in relation to economic growth and development, classical doctrine of natural resource scarcity, impact of technological change.

REFERENCE BOOKS

Barnett, H. & Morse, C. *Scarcity and Growth.* Johns Hopkins Press, 1963.
Dorfman, R. & Dorfman, N. S. eds. *Economics of the Environment. Selected Readings.* Norton, 1972.

SUPPLEMENTARY REFERENCES

Barkley, P. W. & Seckler, D. W. *Economic Growth and Environmental Decay.* Harcourt, Brace & Jovanovich, 1972.
Dales, P. H. *Pollution, Property and Prices.* Toronto U.P., 1968.
Jarrett, H. ed. *Environmental Quality in a Growing Economy.* Johns Hopkins, 1966.
Kneese, A. V. & Herfendahl, D. C. *Introduction to the Economic Theory of Natural Resource Use.* Merrill Publishing Co., 1973.
Mishan, E. J. *Cost Benefit Analysis.* Unwin, 1971.
Sinden, J. ed. *The Natural Resources of Australia.* Angus & Robertson, 1972.

Industrial Economics

First session subject

A study of factors affecting production and productivity, with particular regard to industrial organisation in Australia. The emphasis will be on the industry, the economic sector, and the regional and national organisation of industry, as they affect the decisions relating to employment, investment, innovation, output and income distribution.

REFERENCE BOOKS

Mansfield, E. *Economics of Technical Change.* Longmans.
Needham, D. *Economics Analysis and Industrial Structure.* Holt, Rinehart & Winston, 1970.
Needham, D. ed. *Readings in the Economics of Industrial Organisations.* Holt, Rinehart & Winston, 1970.
Stubbs, P. *Innovation and Research: A Study in Australian Industry.* Cheshire, 1968.

SUPPLEMENTARY REFERENCES

Bain, J. S. *Industrial Economics.* 2nd ed. Wiley, 1968.
Beacham, A. & Williams, L. J. *Economics of Industrial Organisation.* Pitman, 1964.
Department of Labour and National Service. *Annual Reports.*
Edel, M. *Economics and the Environment.* Prentice-Hall, 1973.
Hirst, R. R. & Wallace, R. H. eds. *Studies in the Australian Capital Market.* Cheshire, 1969.
Lamberton, D. M. ed. *Industrial Economics.* Pelican, 1972.
Mansfield, E. *Monopoly Power and Economic Performance.* Rev. ed. Norton, 1968.
Nieuwenhuysen, J. P. ed. *Australian Trade Practices.* Cheshire, 1970.
Nove, A. & Nuti, D. M. eds. *Socialist Economics.* Penguin, 1972.
O'Dea, R. *Industrial Relations in Australia.* West, 1970.
Overseas Investment in Australia. Treasury Research Paper No. 1. May, 1972.
Rose, P. J. *Australian Security Markets.* Cheshire, 1968.
Tariff Board. *Annual Reports.*
Watson, D. S. *Price Theory in Action.* 2nd ed. Houghton Mifflin, 1969.

Economic Policy

Second session subject

This is a study of the objectives of macroeconomic policies, the relations between objectives, and the use of monetary, fiscal and other instruments of policy. Particular attention is given to policies concerned with prices, employment and incomes in Australia and the main instruments available for their implementation.

REFERENCE BOOKS

Corden, W. M. *Australian Economic Policy Discussion.* Melbourne U.P., 1968.
Nevile, J. W. *Fiscal Policy in Australia.* Cheshire, 1970.
Runcie, N. ed. *Australian Monetary and Fiscal Policy.* London U.P., 1971.
Shaw, G. K. *Macroeconomic Policy.* Martin Robertson & Co., 1971.
Smith, W. L. & Teigen, R. L. *Readings in Money, National Income, and Stabilization Policy.* Irwin, 1965.

SUPPLEMENTARY REFERENCES

Abraham, W. I. *National Income and Economic Accounting.* Prentice-Hall, 1969.
Ackley, G. *Macroeconomic Theory.* Rev. ed. Macmillan, 1969.
Arndt, H. W. & Corden, W. M. *The Australian Economy.* Cheshire, 1963.
Commonwealth Treasury. *Treasury Economic Papers No. 1 (1972) and No. 2 (1973).*
Jackson, D., Turner, H. A. & Wilkinson, F. *Do Trade Unions Cause Inflation.* Cambridge U.P., 1972.
Perkins, J. O. N. *Australian Policy for the World Economy.* Allen & Unwin, 1969.
Perkins, J. O. N. & Sullivan, J. *Banks and the Capital Market: An Australian Study.* Melbourne U.P., 1970.
Report of the Committee of Economic Enquiry. (Vernon Report). Vols. 1 & 2. Commonwealth of Australia, Canberra, 1965.
Rose, P. J. *Australian Securities Markets.* Cheshire, 1969.
Runcie, N. *The Economics of Instalment Credit.* London U.P., 1969.
Yeager, L. B. *The International Monetary Mechanism.* Holt, Rinehart & Winston, 1968.

Economic Policy Honours

Second session subject

This includes *Economic Policy* plus additional reading and assignments.

Economic Development

Second session subject

A study of conditions and policies affecting economic development with particular regard to differences between experiences in selected low income countries. Analysis of differences and rates of change in income levels, socio-economic structures and values, and population growth. National policies and plans for different levels of development: infrastructure requirements, technological and manpower requirements, developments in agriculture and industry, internal and external market developments, monetary and fiscal structures, population policy. Project evaluation and implementation. National, inter-regional and inter-sectoral balance and imbalance. International aspects of development: intergovernment operations, bi-lateral and multi-lateral agencies, effective and for development. Students will be required to make a detailed study of any low income country.

REFERENCE BOOKS

Galbraith, J. K. *Economic Development.* Harvard U.P., 1968.
Hirschman, A. *Development Projects Observed.* Brookings, 1967.
Lewis, W. A. *Development Planning.* Allen & Unwin, 1966.
Meier, G. M. *Leading Issues in Development Economics.* Oxford U.P., 1071.
Papanek, G. F. ed. *Development Policy—Theory and Practice.* Harvard U.P., 1968.

SUPPLEMENTARY REFERENCES

Adelman, I. & Morris, C. T. *Society, Politics and Economic Development.* Johns Hopkins, 1967.
Adelman, I. & Thorbecke, E. eds. *The Theory and Design of Economic Development.* Johns Hopkins, 1966.
DeGregori, T. R. & Pi-Sunyer, O. *Economic Development: The Cultural Context.* Wiley, 1969.
Hirschman, A. *The Strategy of Economic Development.* Yale U.P., 1958.
Rostow, W. W. *The Stages of Economic Growth.* C.U.P., 1960.
Spiegelglas, S. & Welsh, C. J. *Economic Development: Challenge and Promise.* Prentice-Hall, 1973.
Theberge, J. D. ed. *Economics of Trade and Development.* Wiley, 1968.

Regional Economics

Second session subject

The nature of the regional problem in Australia and overseas:

1. Inter-regional disparities in unemployment, income and growth. The effect of such disparities on achievement of national macroeconomic goals.
2. The trend toward metropolitan primacy. The costs of economic concentration. Some explanations of the spatial distribution of economic activity: economics of agglomeration, location theories (transport cost and central place theories), economic base theory, export base theory, poles of growth theory, Clark/Fisher thesis, Rose thesis, quality of life.

Some applications of macroeconomic theory at the regional level: regional accounts, regional input-output analysis, regional growth models, regional multipliers, inter-regional trade theory, regional equilibrium analysis.

Australian and European policies for control of spatial distribution of economic activity. Effectiveness of such policies.

REFERENCE BOOKS

McCrone, G. *Regional Policy in Britain.* Allen & Unwin, London, 1969.
Needleman, L. *Regional Analysis.* Penguin, 1968.
Organization for Economic Co-operation and Development. *The Regional Factor in Economic Development.* Paris, 1970.
Richardson, N. *Elements of Regional Economics.* Penguin, 1969.

SUPPLEMENTARY REFERENCES

Allen, K. & Maclennan, M. *Regional Policies and Problems in Italy and France.* Allen & Unwin, London, 1970.
Friedmann, J. & Alonso, W. *Regional Development and Planning.* M.I.T. Press, Cambridge, Mass., 1964.
McKee, D. L. et al. *Regional Economics.* Free Press, N.Y., 1970.
Nourse, H. *Regional Economics.* McGraw-Hill, N.Y., 1968.
Orr, S. C. & Cullingworth, J. B. *Regional and Urban Studies.* Allen & Unwin, London, 1969.
Richardson, N. *Regional Economics.* Weidenfeld & Nicolson, London, 1969.

Mathematical Economics

Second session subject

An introduction to a mathematical treatment of economic theory; theory of consumer behaviour, theory of production and profit maximization, mathematical analysis of market structures, introduction of dynamics.

REFERENCE BOOK

Archibald, G. C. & Lipsey, R. G. *An Introduction to a Mathematical Treatment of Economics.* Weidenfeld & Nicolson, 1967.

SUPPLEMENTARY REFERENCES

Allen, R. G. D. *Mathematical Analysis for Economics.* Macmillan, 1964.
Allen, C. L. *Elementary Mathematics of Price Theory.* Wadsworth Publishing Co., 1962.
Henderson, J. M. & Quandt, R. E. *Microeconomic Theory.* McGraw-Hill, 1971.
Henry, S. G. B. *Elementary Mathematical Economics.* Routledge & Kegan Paul, 1969.
Huang, D. S. *Introduction to the Use of Mathematics in Economic Analysis.* Wiley, 1964.
Tintner, G. & Milham, C. B. *Mathematics and Statistics for Economics.* Holt, Rinehart & Winston, 1970.

Operations Research

First session subject

Linear, non-linear and dynamic programming. Theory of games.

TEXTBOOK

Hillier, F. S. & Lieberman, G. J. *Introduction to Operations Research.* Holden-Day.

Transport Economics

Second session subject

This subject will be a study of the economics of transportation based on the spatial analysis of transport systems, including the following aspects:

1. Distance, movement and location theory
2. Network location, structure and measurement: terminal location, morphology
3. Rating, spatial patterns and intermodal competition
4. Movement, gravity and interaction models
5. Intra-urban transport, traffic and land use
6. Transport and economic development

REFERENCE BOOKS

Meyer, J. R., Kain, J. F. & Wohl, M. *The Urban Transportation Problem.* Harvard U.P., 1969.
Munby, D. *Transport—Selected Readings.* Harmondsworth, 1968.
Munby, D. *Traffic in Towns.* Penguin, 1964.

SUPPLEMENTARY REFERENCES

Blunden, W. R. *The Land-Use Transport Systems, Analysis and Synthesis.* Penguin, N.Y., 1971.
Clark, N. ed. *Analysis of Urban Development.* Proceedings of the Tewksbury Symposium. University of Melbourne, 1970.
Garrison, W. L. & Marble, D. F. eds. *Quantitative Geography.* Part 1. Economic and Cultural Topics. Northwestern University Studies in Geography. No. 13. Evanston, 1967.

Haggett, P. *Locational Analysis in Human Geography.* Edward Arnold, London, 1965.
Haggett, P. & Chorley, R. J. *Network Analysis in Geography.* Edward Arnold, London, 1969.
Horton, F. ed. *Geographic Studies of Urban Transportation and Network Analysis.* Northwestern University Studies in Geography. No. 16. Evanston, 1968.
Isard, W. *Location and Space Economy.* M.I.T. Press, Cambridge, 1956.
Kansky, K. J. *Structure of Transportation Networks.* University of Chicago Research Paper No. 84, 1963.
Kolsen, H. M. *The Economics and Control of Road—Rail Competition.* Sydney U.P., 1968.
Olsson, G. *Distance and Human Interaction.* A Review and Bibliography. Regional Science Research Institute Bibliography Series No. 2. Philadelphia, 1965.
Sealy, K. R. *The Geography of Air Transport.* Hutchinson, London, 1968.
Smerk, G. M. ed. *Readings in Urban Transportation.* Indiana U.P., Bloomington, 1968.
Starkie, D. N. M. *Traffic and Industry.* London School of Economics and Political Science Geographical Papers No. 3. 1969.
Wolforth, J. W. *Residential Location and the Place of Work.* B.C. Geographical Series. No. 4. Vancouver, 1965.

Advanced Economic Analysis

Double session subject

This subject, together with the completion of the thesis, occupies the final year of the full-time Honours degree course. It consists of six parts, each of which normally requires 21 class hours. The whole amounts to a survey of advanced economic theory; it normally includes advanced macro- and micro-economics, cyclical fluctuations, economic growth, monetary theory, international economics, welfare, and history of economic thought.

ELECTRICAL ENGINEERING

1. Subjects are listed in alphabetical order, i.e.
   Circuit Theory 1, 2, 3, 4, 5
   Computer Systems Engineering 1, 2
   Control 1, 2, 3
   Electrical Properties of Materials 1, 2
   Electronics 1, 2, 3, 4, 5
   Electronics and Circuit Theory 1, 2
   Energy Conversion 1, 2
   Machines (and Transformers) 1, 2, 3, 4
   Power Systems
2. Prerequisites: Engineering 2 subjects are prerequisites for Engineering 3 subjects, and Engineering 3 subjects are prerequisites for Engineering 4 subjects.
3. Assessment: Composite (based on exams, tests, assignments and laboratory reports) for a single subject or a group of subjects in a particular year or stage.

Circuit Theory I

Single session subject

Electromagnetic fields and circuit concepts, Kirchhoff's laws and elementary circuit analysis. Responses of elementary circuits, introduction to sinusoidal steady state.

TEXTBOOK

Chirlian, P. M. *Basic Network Theory*. McGraw-Hill, 1969.

Circuit Theory 2

Single session subject

Basic network topology, mesh, nodal and cut-set analysis, Laplace transform methods and generalised analysis, sinusoidal steady state.

TEXTBOOK

As for *Circuit Theory 1.*

Circuit Theory 3

Single session subject

State space analysis, two port networks, network theorems, signal flow graphs, transmission lines. Fourier series and integral.

TEXTBOOK

As for *Circuit Theory 1.*

Circuit Theory 4

Single session subject

Network functions. Synthesis of two-element-kind one-port networks, two-port networks.

TEXTBOOK

Ruston, H. & Bordogna, J. *Electric Networks, Functions, Filters, Analysis.* McGraw-Hill, 1966.

Circuit Theory 5

Single session subject

Two-port network analysis, filters, methods of network analysis, lattice networks.

TEXTBOOK

As for *Circuit Theory 4.*

Computer Systems Engineering 1

Single session subject

Switching algebra, combinational and sequential logic. Number systems and codes. Computer structure.

TEXTBOOK

Hill, F. J. & Peterson, G. R. *Introduction to Switching Theory and Logical Design.* Wiley, 1968.

Computer Systems Engineering 2

Single session subject

Digital circuit implementation, logic systems, analogue to digital and digital to analogue convertors, analogue and hybrid computation.

TEXTBOOK

No set text.

Control 1

Single session subject

Analysis of linear systems, frequency response, stability, design procedure. Control system components, transducers, measurements. Computing and simulating systems.

TEXTBOOK

Harrison, H. L. & Bollinger, J. G. *Introduction to Automatic Controls.* International Textbook Co., 1970.

Control 2

Single session subject

Controlability and observability, stability of linear servo mechanisms, sensitivity and error analysis, synthesis of linear servo mechanisms.

TEXTBOOK

Elgerd, O. I. *Control Systems Theory.* McGraw-Hill, 1967.

Control 3

Single session subject

Computers in control, non-linear control systems, signal modulated systems, optimal control.

TEXTBOOK

As for *Control 2.*

Electrical Properties of Materials 1

Single session subject

Ionisation and decay processes; electric breakdown in solid, liquid and gaseous dielectrics, in uniform and non-uniform fields.

TEXTBOOK

Kuffel, E. & Abdullah, M. *High-voltage Engineering.* Pergamon, 1970.

Electrical Properties of Materials 2

Single session subject

Generation and measurement of high voltages for testing purposes. Non-destructive insulation test techniques, high-voltage and high-frequency dielectric loss measurements, discharge measurements.

TEXTBOOK

As for *Electrical Poperties of Materials 1.*

Electronics 1

Single session subject

Conduction mechanisms and flow of charge carriers in semi-conductors. Device structures. Properties of junctions. Diode circuits and models.

TEXTBOOK

Gray, P. E. & Searle, C. L. *Electronic Principles: physics, models and circuits.* Wiley, 1969.

Electronics 2

Single session subject

Transistors, BJT, MOSFET, JFET, and their models for active-region operation. Biasing. Frequency response of discrete and integrated amplifiers. Feedback and stability. Applications of linear integrated circuits.

TEXTBOOKS

As for *Electronics 1*, plus:

Millman, J. & Halkias, C. C. *Integrated Electronics: Analog and Digital Circuits and Systems.* McGraw-Hill, 1972.

Electronics 3

Single session subject

Charge-control models for switching operation of transistors. Switching circuits. Basic digital circuits, discrete and integrated, and their applications.

TEXTBOOKS

As for *Electronics 2*

Electronics 4

Single session subject

Modulation systems, AM, DSB, SSB, FM, PM. Modulators and detectors. Tuned power amplifiers. Microwave devices. Noise and performance of passive and active devices and circuits.

TEXTBOOK

Betts, J. A. *Signal Processing, Modulation and Noise.* E.U.P., 1970.

Electronics 5

Single session subject

Guided electromagnetic waves, waveguides and transmission lines. Elements of microwave networks, cavity resonators, directional couplers, isolators, circulators and switches. Radiation and antennas. Antenna arrays, gain, directivity and bandwidth.

TEXTBOOK

Ramo, S., Whinnery, J. R. & Van Duzer, T. *Fields and Waves in Communication Electronics.* Wiley, 1965.

Applied Electricity I

Double session subject

A course for metallurgists and engineers not intending to follow electrical engineering as a profession, presenting selected topics from circuit theory, electronic devices and their applications in linear and digital circuits, electromagnetic devices, and instrumentation systems.

TEXTBOOK

Smith, R. J. *Circuits, Devices and Systems.* 2nd ed. Wiley, 1970.

Energy Conversion 1

Single session subject

Energy in electric and magnetic fields. Electromechanical energy conversion, reactors, measuring transducers.

TEXTBOOK

No set text.

Energy Conversion 2

Single session subject

Mutually coupled circuits, transformers, singly and multiply excited circuits. Introductory d.c. and a.c. machines.

TEXTBOOK

Gourishanker, V. *Electro-Mechanical Energy Conversion.* International Textbook Co.

Machines and Transformers 1

Single session subject

Principles of steady state and transient performance of d.c. and cross field machines and transformers.

TEXTBOOK

Fitzgerald, A. E., Kingsley, C. & Kusco, A. *Electric Machinery.* 3rd ed. McGraw-Hill.

Machines and Transformers 2

Single session subject

Steady state performance of polyphase synchronous and induction machines. Static convertors.

TEXTBOOK

As for *Machines and Transformers 1.*

Machines 3

Single session subject

Performance of commutator and single phase induction machines. Introduction to matrix methods and transformation techniques in machine analysis.

TEXTBOOKS

Brosan, G. S. & Hayden, J. T. *Advanced Electrical Power and Machines.* Pitman, 1966.

O'Kelly, P. & Simmons, S. *Introduction to Generalised Electrical Machine Theory.* McGraw-Hill, 1968.

Machines 4

Single session subject

Electrical transient and dynamic performance of machines and applications of solid state devices to machine control.

TEXTBOOK

As for *Machines 3* and *Machines and Transformers 1.*

Power Systems

Single session subject

Properties of multi-conductor transmission systems; symmetrical component analysis; system stability, surges, protection, economic optimisation.

TEXTBOOK

Elgerd, O. I. *Electric Energy Systems Theory.* McGraw-Hill, 1971.

ENGLISH

In 1974 the Department of English will offer subjects in English I, II and III Pass and English II, III and IV Honours in the B.A. degree course, and also in the first year of the M.A. Pass degree course.

Each subject comprises at least 28 hours (2 hours per week per session) of lectures, seminars and tutorials. Some subjects are optional. In principle, students may choose those subjects that interest them most. Not all subjects, however, will be offered at both day and evening times. Furthermore, the Head of the Department of English reserves the right to place a limit on numbers in particular subjects, and to advise students on the subjects best suited to their qualifications and purposes. As many of the subjects described in the following pages will be offered as can be with the staff available.

Pass students are required to take FOUR, and Honours students, SIX subjects in each year. In addition to those subjects designated as compulsory, Honours students must take at least **one** of the Old English Language or the Medieval English Literature subjects. (Second year Honours students should note that additional options in Medieval English Literature will be available in 1975.)

In all subjects, students will be required to hand in written assignments and sit for examinations during or at the end of each session. English IV Honours students are also required to write a thesis of 12,000-15,000 words on a topic approved by the Head of the Department.

ENGLISH I

First Session

Students are required to choose, in each session, *two* of the subjects listed.

Critical Method—Poetry

Problems and techniques involved in the criticism of poetry; critical discussion and interpretation of selected poems.

TEXTBOOKS

Brooks & Warren. *Understanding Poetry.* 3rd ed. Holt, Rinehart & Winston.

Modern Fiction

Part I: The problems and techniques involved in the criticism of fiction; critical discussion and interpretation of selected modern short stories and novels.

BASIC READING

Daiches, David. *The Study of Literature.* Norton.
Short Story Masterpieces, ed. Robert Penn Warren and Albert Erskine. Dell.
Lawrence. *The Prussian Officer; St. Mawr and the Virgin and the Gypsy.* Penguin.
Hemingway. *The Essential Hemingway.* Penguin.

Introduction to English Language Studies

Part I: Present day English, its sound system, vocabulary and structure.

TEXTBOOKS

Delbridge, A. & Bernard, J. R. L. *Patterns in Language.* Angus & Robertson.
Quirk, R. *The Use of English.* 2nd ed. Longmans.

ENGLISH I

Second Session

Modern Poetry

Varying critical approaches to modern poetry; interpretation and discussion of selected modern poems.

BASIC READING

Modern Poetry, ed. Mack, Dean & Frost. 2nd ed. Prentice-Hall.
Poems of Our Moment, ed. John Hollander. Pegasus.

Modern Fiction

Part II: Critical interpretation and discussion of the short stories and novels of selected modern writers.

BASIC READING

Conrad. *Heart of Darkness.* Dent. *Nostromo.* Penguin.
Joyce. *Dubliners; A Portrait of the Artist as a Young Man.* Penguin.
Cary. *Herself Surprised.* Harper & Row. *The Horse's Mouth.* Penguin. *To be a Pilgrim.* Harper & Row.
White. *The Burnt Ones; Riders in the Chariot.* Penguin.

Introduction to English Language Studies

Part II: The development of English up to the early modern period; introduction to Chaucer's Language.

TEXTBOOKS

Alexander, H. *The Story of Our Language.* Anchor.
Howard, D.R. ed. *Geoffrey Chaucer: The Canterbury Tales, A Selection.* Signet.

ENGLISH II—COMPULSORY SUBJECTS

First Session

Victorian Fiction

The novels of Dickens, Thackeray, Emily Brontë and George Eliot.

BASIC READING

Dickens. *Pickwick Papers; Hard Times; Our Mutual Friend.*
Thackeray. *Vanity Fair.*
Emily Brontë. *Wuthering Heights.*
George Eliot. *The Mill on the Floss; Middlemarch.*

Second Session

The Poetry of Byron, Wordsworth and Keats

RECOMMENDED TEXTS

Byron. *Poems.* Oxford Standard Authors.
Wordsworth. *Selected Poetry*, ed. Van Doren. Modern Library.
Keats. *Complete Poetry and Selected Prose*, ed. Briggs. Modern Library.

ENGLISH III—COMPULSORY SUBJECTS

First Session

The Novel in the Eighteenth Century

BASIC READING

Defoe. *Robinson Crusoe; Moll Flanders.*
Richardson. *Pamela.*
Fielding. *Joseph Andrews; Tom Jones.*
Sterne. *Tristram Shandy.*
Smollett. *Humphrey Clinker.*

Second Session

The Poetry of Milton, Dryden and Pope

RECOMMENDED TEXTS

Sutherland, J. *A Preface to Eighteenth Century Poetry.* O.U.P.
Paradise Lost and Selected Poetry and Prose of John Milton, ed. Northrop Frye. Holt, Rinehart & Winston.
Selected Poetry and Prose of John Dryden, ed. Earl Miner. Modern Library.
The Poems of Alexander Pope, ed. J. Butt. Methuen ('Twickenham' one-volume edition).

ENGLISH II AND III—OPTIONS

First Session

Australian Fiction to 1920

BASIC READING

Kingsley. *The Recollections of Geoffry Hamlyn.* O'Neil Classics.
Clarke. *For the Term of His Natural Life.* Pacific.
Browne, T. A. ('Rolf Boldrewood'). *Robbery Under Arms.* St. Martin's Library.
Lawson. *Selected Stories.* ed. Matthews. Rigby, Seal Publications.
Furphy. *Such is Life.* Angus & Robertson.
Richardson. *The Fortunes of Richard Mahony.* Heinemann.

Shakespeare's History Plays

Richard III; King John; Richard II; Henry IV (both parts); and *Henry V.*

Students are advised to use the separate volumes of the New Arden Shakespeare (Methuen), the New Shakespeare (C.U.P.), the Signet Classics or the New Penguin Shakespeare.

Chaucer's Canterbury Tales

TEXTBOOK

Robinson, F. N. ed. *The Works of Geoffrey Chaucer.* Houghton Mifflin.

Second Session

Australian Fiction after 1920

BASIC READING

Prichard. *Coonardoo.* Angus & Robertson.
Herbert. *Capricornia.* Angus & Robertson.
Dark. *The Timeless Land.* Collier.

Boyd. *Lucinda Brayford.* Lansdowne.
Stead. *Seven Poor Men of Sydney.* Pacific.
White. *The Aunt's Story; The Tree of Man; The Solid Mandala.* Penguin.
Keneally. *Bring Larks and Heroes.* Sun; *Three Cheers for the Paraclete.* Penguin.

Nineteenth Century American Literature

Selected novels by authors from Thoreau to James.

BASIC READING

Thoreau. *Walden.* Norton Critical Edition.
Hawthorne. *The Scarlet Letter.* Norton Critical Edition.
Poe. *The Fall of the House of Usher.* Signet.
Melville. *Moby Dick.* Norton Critical Edition. *Billy Budd.* Signet.
Twain. *Huckleberry Finn; Life on the Mississippi.* Signet.
Crane. *The Red Badge of Courage.* Norton Critical Edition.
James. *Portrait of a Lady.* Penguin.

Medieval English Literature

The romance, lyric and drama.

TEXTBOOK

Haskell, A. S. ed. *A Middle English Anthology.* Anchor.

ENGLISH IV (HONOURS)

First Session

Critical Practice and Theory

Part I:

(A) Selected critical essays on a number of major literary texts. The essays will be chosen to illustrate a variety of critical approaches. The list of texts will include Shakespeare's *Othello* and *Macbeth*, Donne's *Songs and Sonnets*, Swift's *A Tale of a Tub*, and Sterne's *Tristram Shandy*.

(B) Selected essays on critical theory by Aristotle, Horace, Longinus, Dryden, Johnson and Shelley. Students are advised to purchase *Classical Literary Criticism* (Penguin), *Of Dramatic Poesy and Other Critical Essays*, ed. G. Watson (2 vols., Everyman), Johnson's *Shakespeare Criticism* (Penguin) and Johnson's *Lives of the Poets* (Everyman, 2 vols.).

Elizabethan Drama

Selected plays by Lyly, Peele, Kyd, Marlowe, Greene; Shakespeare's early plays, Comedies and "Problem Plays".

RECOMMENDED TEXTS

Minor Elizabethan Drama. 2 vols. Everyman.
Alexander's (Collins) or Sisson's (Odhams) edition of Shakespeare's plays, or the separate volumes of the New Arden Shakespeare (Methuen), the New Shakespeare (C.U.P.), the Signet Classics or the New Penguin Shakespeare.

Renaissance Poetry

The works of particular poets are prescribed, but the subject of study will be not so much authors as the principal modes, themes and conventions of sixteenth- and seventeenth-century English poetry.

TEXTBOOKS

Thomas Wyatt. *The Collected Poems*, ed. Kenneth Muir. Muses Library.
Philip Sidney. *Selected Prose and Poetry*, ed. Robert Kimbrough. Holt, Rinehart & Winston.
Edmund Spenser. *The Poetical Works of Edmund Spenser*, ed. J. C. Smith and E. de Selincourt. Oxford Standard Authors.
Walter Ralegh. *The Poems of Sir Walter Ralegh*, ed. Agnes M. C. Latham. Muses Library.
William Shakespeare. *Shakespeare's Songs and Poems*, ed. Edward Hubler. McGraw-Hill.
Ben Jonson. *The Complete Poetry of Ben Jonson*, ed. William B. Hunter, Jr. Doubleday.
John Donne. *Poetical Works*. Oxford Standard Authors.
Chambers, E. K. ed. *The Oxford Book of Sixteenth Century Verse*. O.U.P.
The Oxford Book of Seventeenth-Century Verse, ed. H. J. Grierson and G. Bullough. O.U.P.

Literary Scholarship

A study of research methods, with special reference to textual problems in Shakespeare.

ENGLISH IV (HONOURS)

Second Session

Critical Practice and Theory

Part II:

(A) Selected essays on a number of major texts. The list of texts will include Coleridge's *The Ancient Mariner*, Shelley's lyric poems, Melville's *Moby Dick*, Dickens' *Little Dorrit*, Eliot's *The Waste Land* and Faulkner's 'The Bear'.

(B) Selected essays on critical theory by Matthew Arnold, Henry James, T. S. Eliot, I. A. Richards, F. R. Leavis, Empson, Wellek, Frye and Lionel Trilling. Students are advised to purchase *Five Approaches of Literary Criticism*, ed. Wilbur Scott (Collier), *Principles of Literary Criticism* and *Practical Criticism* by I. A. Richards (Routledge), *Seven Types of Ambiguity* by Empson (Peregrine), *Beyond Culture* by Lionel Trilling (Penguin), and F. C. Crews, *Pooh Perplex* (University of California Press paperback).

Jacobean Drama

Selected plays by Jonson, Chapman, Marston, Tourneur, Webster, Middleton, Beaumont and Fletcher, Massinger.

Late Seventeenth-Century Literature

A study of selected works by Bunyan, Dryden, Pepys, Etherege, Rymer, Wycherley, Rochester, Otway and Congreve.

GENERAL STUDIES

It is a requirement of all undergraduate courses* that the programme of study include certain subjects of a general nature in addition to those vocational subjects in which the student must specialise.

Since 1971 the normal general studies requirement has been 168 hours for full-time courses of at least four years duration and 126 hours for three-year full-time courses. The corresponding figures for part-time courses are 168 hours for courses of over six years and 126 hours for courses of six years and under. This means that students in the longer courses will take four subjects and those in the shorter courses will take three.

The General Studies programme at Wollongong University College consists of fourteen-week subjects, each of which in turn consists of fourteen lectures and seven tutorials.

The programme is designed to cover various aspects of the modern world, its thought and artistic expression.

Where a subject is offered in two parts, Part II will allow students who have shown interest and ability in Part 1 to pursue the subject further and at greater depth in the second session.
The subjects offered in 1973 are:

First Session:
English Language and Literature
Aspects of Modern Psychology, Part I
Contemporary History, Part I
Architecture, Part I
Population Studies
A History of Modern Art, Part I

Second Session:
Introduction to English Linguistics
Aspects of Modern Psychology, Part II
Contemporary History, Part II
Architecture, Part II
A History of Modern Art, Part II
Aspects of Industrial Society
Developments in Present Day Music.

Advanced Elective for Honours Students: Asia in the Twentieth Century (28 weeks).

FIRST SESSION

English Language and Literature

This subject consists of an introduction to the English Language and a discussion of some significant prose writings by twentieth century authors.

TEXTBOOKS
Baldwin, J. *The Fire Next Time.* Penguin.
Camus, A. *The Outsider.* Penguin.
Koestler, A. *Darkness at Noon.* Penguin.
Miller, A. *Death of a Salesman.* Penguin.
Potter, S. *Our Language.* Pelican.
Seymour, A. ed. *Three Australian Plays.* Penguin.
Snow, C. P. *The Two Cultures: and a Second Look.* C.U.P.

*Except those for the Bachelor of Arts Degree.

Aspects of Modern Psychology

Part I

The course introduces students to developments in contemporary psychology, with special emphasis on the relevance of recent research to basic human problems: human development; control of behaviour; identity and the identity crisis; conformity, compliance and integrity; conflict and conflict resolution. Presentation will be aimed at stimulating interest and encouraging further reading in this subject.

TEXTBOOK

Werthmeimer, M. ed. *Confrontation: Psychology and the Problems of Today.* Scott Foresman, 1970.

A list of additional references will be supplied at the beginning of the course.

Contemporary History

This course seeks to develop an awareness of the contemporary world through the study of some important issues. Contemporary history takes problems that are actual in the world today and examines them from the time they first take recognisable shape. The focus will be on events since 1945, but the roots of the problems will often necessitate a backward look to earlier periods.

Part I: The first part of the course will lay the necessary foundation (especially for students who have not seriously studied the subject before) and will then begin the study of certain issues like the changing face of Communism, Superpowers, the Cold War, and World Co-operation.

TEXTBOOKS

Barraclough, G. *An Introduction to Contemporary History.* Penguin.
Henderson, J. L. ed. *Since 1945: Aspects of Contemporary History.* Methuen.
Henderson, J. L. ed. *World Questions: A Study Guide.* Methuen.

REFERENCE BOOKS

A comprehensive list of reference books dealing with particular topics in Parts I and II will be provided at the beginning of the course.

Architecture

The course is offered in two closely related parts, the second designed for those students who have developed an understanding of and interest in the ideas presented in the first session.

Part I: The aim is to demonstrate how modern architecture is a mirror of our times, just as the architecture of an earlier age reflected that particular age. The main focus will be on 'the walls around us' now, though this will necessarily include reference to styles of other periods.

TEXTBOOKS

Pevener, N. *An Outline of European Architecture.* Pelican.
Richards, J. M. *An Introduction to Modern Architecture.* Pelican.

REFERENCE BOOKS

Cichy, B. *Architecture of the Ancient Civilization in Colour.* Thames & Hudson.
Fletcher, B. *A History of Architecture.* Batsford.
Freeland, J. M. *Architecture in Australia.* Cheshire.

Population Studies

This subject is intended to present a world picture of population on a regional basis, with emphasis on spatial differences of selected characteristics of population. It examines population growth and patterns of density; the age and sex composition; cultural and economic determinants of population numbers and distribution; socio-economic evolution of mankind and urbanization; the balance of people and resources; the future pattern of population.

TEXTBOOK

Zelinsky, W. *A Prologue to Population Geography.* Prentice-Hall.

REFERENCE BOOKS

Broek, J. O. & Webb, W. J. *A Geography of Mankind.* McGraw-Hill.
Clarke, J. I. *Population Geography.* Pergamon.
Wilson, A. *Population Geography.* N.A.P.

A History of Modern Art

The course will be offered in two parts, the first providing the background to an understanding of more traditional as well as more recent art, the second looking at art in Australia.

Part I

RECOMMENDED READING

Bazin, G. *A Concise History of Art, Part II.* Thames & Hudson.
Horton, M., ed. *Art in Australia.* Ure Smith.
Lucie-Smith, E. *Art Movements Since 1945.* Thames & Hudson.
Read, H. *A Concise History of Modern Painting.* Thames & Hudson.
Whelpton, B. *Art Appreciation Made Simple.* W. H. Allen.

SECOND SESSION

An Introduction to English Linguistics

The subject will introduce students to the main approaches of linguistics as applied to a study of English. Students intending to enrol in this subject are advised that it assumes a basic understanding of the language as given in the first session subject English Language and Literature.

TEXTBOOKS

Delbridge, A. & Bernard, J. R. L. *Patterns in Language.* Angus & Robertson.
Palmer, F. *Grammar.* Pelican.

REFERENCE BOOKS

A reference list of books and articles will be provided at the beginning of the course.

Aspects of Modern Psychology

Part II

In Part II of this course, special attention will be given to such questions as: racism and race relations; violence and aggression; man and technology; education, creativity, and the student; the psychology and treatment of abnormal behaviour.

TEXTBOOK

Wertheimer, M. ed. *Confrontation: Psychology and the Problems of Today.* Scott Foresman, 1970.

A list of additional references will be supplied at the beginning of the course.

Contemporary History

Part II: The second part of the course will further explore such questions as the growth of nationalism in Africa and Asia; the Middle East; Latin America; democracy in theory and practice; race relations; twentieth century revolutions and guerrilla warfare.

RECOMMENDED READING

As for *Contemporary History, Part I*, plus:

Legum, C. ed. *Africa Handbook.* Penguin.

Architecture

Part II: Man and Architecture. Building on the first session course, this will pursue more closely the concept of architectural expression, considering how this has reflected and can be expected to reflect man's outlook in the future. The hypothesis would thus contemplate the structure of man's future environment while remaining aware of previous cycles in the history of civilization.

TEXTBOOKS

As for *Architecture, Part I*, plus:

Freeland, J. M. *Architecture in Australia.* Cheshire.

REFERENCE BOOKS

A list of reference material will be supplied at the beginning of Part II.

A History of Modern Art

Part II: This part of the course goes on to deal with the development of art in Australia, with special attention to certain major artists and movements.

RECOMMENDED READING

As for *History of Modern Art, Part I*, but additional references to Australian Art will be given during the course.

Aspects of Industrial Society

A one-session subject which considers some of the social and economic aspects of industrial society. Topics to be discussed include the impact of industrial society on the individual, its effects on the qualify of life, the complexity of social and economic institutions and organisations, automation and changing industrial technology, the problems of poverty in an affluent society and the causes and consequences of rapid social change.

There will be 1½ hours per week made up of lectures and seminars: a 1½ hour examination paper will be held at the end of the session.

A detailed reading list for each topic and assignment will be handed out at the first lecture.

TEXTBOOKS

Faunce, W. A. *Problems of an Industrial Society.* McGraw-Hill.

Ben, J. *Harmony and Conflict in Modern Society.* McGraw-Hill.

Developments in Present Day Music

The subject will seek to give an understanding and appreciation of twentieth century music by means of discussion and illustration. The main points to be dealt with are: recent developments in music; changing elements in music's vocabulary; the development of jazz; electronic music; the music of Asia and its influence on modern European music; and the making of music in Australia at the present time.

RECOMMENDED READING

Abraham, C. *A Hundred Years of Music.* Duckworth, 1964.
Covell, R. *Australia's Music: Themes of a New Society.* Sun Books, Melbourne, 1967.
Malm, W. P. *Music Cultures of the Pacific, The Near East and Asia.* Prentice-Hall, 1967.
Myers, R. ed. *Twentieth Century Music.* John Calder, 1960.
Salzman, E. *Twentieth Century Music: An Introduction.* Prentice-Hall, 1967.
Schuller, G. *Early Jazz: Its Roots and Music Development.* O.U.P., 1961.

Asia in the Twentieth Century *(Advanced Elective for Honours Students)*

The subject, which runs for 28 weeks (42 hours) is a survey of the main problems in Asian history today commencing with a brief survey of Asia at the beginning of the 20th century, the decline of the old imperialism after 1918, and the rise of Japan.

The course of World War II in the Pacific and its consequences are evaluated; economic, political, and social and foreign policy problems since 1945 are considered in relation to Japan, China, India, Pakistan and the nations of S.E. Asia. Particular reference is made to the new nationalism and its inter-action with communism, democracy and authoritarianism. The wars in Indo China and Korea are examined in the light of new theories of warfare.

Finally, Australia as an extension of Asia will be discussed.

TEXTBOOKS

Bastin, J. & Benda, H. J. *A Modern History of South-East Africa.* Prentice-Hall, 1968.
Crozier, B. *Southeast Asia in Turmoil.* Penguin.
Macmahon Ball, W. *Australia and Japan.* Nelson.
Schurmann, F. & Schell, O. ed. *China Readings: Republican China.* Vol. 2. Penguin.
Storry, R. *A History of Modern Japan.* Pelican.
Wint, G. *Asia Handbook.* Penguin.

GEOGRAPHY

The Department of Geography offers subjects in Geography I and II Pass, and Geography II Honours, and Geography IIIA, IIIB, IIIC and IIID Pass, and Geography IIIA and IIIB Honours and IV Honours in the BA degree course, and also Geography I and II in the BSc degree course.

All subjects for Geography I and II are compulsory. They comprise physical and human geography, in Geography I, and urban location and structure, quantitative methods, biogeography and regional geography, in Geography II. Geography II Honours consists of the Geography II Pass course plus additional and more advanced work in each subject, and one extra lecture/seminar per week.

In Geography III there are four subjects from which students choose two. In principle, students take the subjects that interest them most, and provision is also made for all four subjects to be studied. Thus the following combinations are offered at pass level:

Geography IIIA (soil studies and geomorphology)

Geography IIIB (agricultural geography and geography of transport systems)

Geography IIIC (agricultural geography and geomorphology)

Geography IIID (soil studies and geography of transport systems).

A further third year option in the geography of population is being planned for the second session of 1974.

Geography IIIA and IIIB are for those students who wish to take all four subjects and Geography IIIC and IIID are for those who wish to combine a particular subject in economic geography, with one in physical geography. There will be at least two separate days' field tutorials in Geography I and field schools of up to four days in Geography II and up to five days in Geography III; additional field tutorials in Geography II and III may be arranged as required.

Not all lectures will be offered at both day and evening times. Also, the Head of the Department reserves the right to place a limit on the numbers of students in Geography I and II and in the subjects in Geography III, and to advise students on the subjects best suited to their qualifications and purposes. As many of the courses described in the following pages will be given as can be with the staff available. In all subjects students will be required to hand in written assignments and sit for examinations during or at the end of each session. Between 20 and 30 per cent of the final marks in each of the three years will be allocated to formal essays and written practical work. However, credit cannot be obtained for any subject or part, independently of the whole year's work.

GEOGRAPHY I

First session

Physical Geography

An introductory study of the main physical and biogeographical areas of geography in relation to process and interdependencies, and in consideration of the variation in the main spatial patterns at global and Australian scale.

TEXTBOOKS

Patton, C. P., Alexander, C. S. & Kramer, F. L. *Physical Geography.* Wadsworth, Belmont, 1970.

It is also necessary that students purchase one of these atlases:

Fullard, H. & Darby, H. C. *The University Atlas; The Oxford Atlas.* O.U.P., London, 1967.

REFERENCE BOOKS

Birot, P. *General Physical Geography.* Harrap, 1966.
De Laubenfels, D. J. *A Geography of Plants and Animals.* Brown, Dubuque, 1970.
Dury, G. H. *Face of the Earth.* Penguin.
Dury, G. H. *Map Interpretation.* London, 1960.
Eyre, S. R. *Vegetation Soils: A World Picture.* Arnold, London, 1963.
Hare, F. K. *The Restless Atmosphere.* Hutchinson, London, 1966.
Leeper, G. N. ed. *The Australian Environment.* CSIRO, 1971.
Miller, A. *Meteorology.* Merrill, Columbus, 1971.
Monkhouse, F. J. & Wilkinson, H. R. *Maps and Diagrams.* Methuen, London, 1964.
Robinson, A. H. *Elements of Cartography.* Wiley, N.Y., 1964.
Rumney, G. R. *The Geosystem.* Brown, 1970.
Strahler, A. N. *Physical Geography.* Wiley, N.Y., 1970.
Trewartha, G. T. *An Introduction to Climate.* McGraw-Hill, N.Y., 1968.
Tweedie, A. D. *Water and the World.* Nelson. Paperback.
Twidale, C. R. & Foale, M. R. *Landforms Illustrated.* 1968.

GEOGRAPHY I

Second session

Human Geography

The way in which people perceive and organise space differs in different places because of peculiar or unique factors, but there are general principles of human spatial behaviour which create regularities of organisation and structure. This introductory subject in human geography focuses on the relationships between spatial structure and process in order to emphasize patterns in space—industrial and urban patterns, population distribution patterns, transport network patterns, agricultural patterns and so on.

Laboratory sessions will introduce the student to techniques of analysis and the representation and interpretation of data.

TEXTBOOKS

Cities. Scientific American. Penguin, 1970. Paperback.
Clarke, J. I. *Population Geography.* Pergamon, 1972.
Monkhouse, F. J. & Wilkinson, H. R. *Maps and Diagrams.* Methuen, London, 1971.
Morrill, R. L. *The Spatial Organisation of Society.* Wadsworth, Belmont, 1970.

REFERENCE BOOKS

Abler, R., Adams, J. S. & Gould, P. *Spatial Organization, The Geographer's View of the World.* Prentice-Hall, N.J., 1971.
Alexander, J. W. *Economic Geography.* Prentice-Hall, N.Y., 1964.
Beaujeu-Garnier, J. & Chabot, G. *Urban Geography.* Longmans, London, 1967.
Brock, J. O. M. & Webb, J. W. *A Geography of Mankind.* McGraw-Hill, Sydney, 1968.
Chapin, F. S. *Urban Land Use Planning.* Illinois U.P., Urbana, 1955.
Chisholm, M. *Rural Settlement and Land Use.* Hutchinson, London, 1964.
Chorley, R. J. & Haggett, P. *Socio-Economic Models in Geography.* Methuen, London, 1968.
Clark, N. ed. *Analysis of Urban Development.* Proceedings of the Tewksbury Symposium, University of Melbourne, 1970.
Demko, G. J., Rose, H. M. & Schnell, G. A. *Population Geography: A Reader.* McGraw-Hill, Sydney, 1970.
Haggett, P. *Locational Analysis in Human Geography.* Arnold, London, 1965.

McCarthy, H. H. & Lindberg, J. B. *A Preface to Economic Geography.* Prentice-Hall, N.Y., 1966.
Mayer, H. M. & Kohn, C. F. *Readings in Urban Geography.* University of Chicago, 1959.
Maloney, F. J. *Facts and Figures.* Pelican, London, 1963.
Murphy, R. E. *The American City, An Urban Geography.* McGraw-Hill, N.Y., 1966.
Neutze, G. M. *Economic Policy and Size of Cities.* A.N.U. Press, 1967.
Robinson, A. H. *Elements of Cartography.* Wiley, N.Y., 1964.
Rose, A. J. *Patterns of Cities.* Nelson, Melbourne, 1968.
Smailes, A. E. *The Geography of Towns.* Hutchinson, London, 1968.
Stratton, H. *Ideas for Australian Cities.* Angus & Robertson, Sydney, 1969.
Thomson, R. S., Conkling, E. C. & Yates, M. B. *The Geography of Economic Activity.*
Thompson, W. R. *A Preface to Urban Economics.* Johns Hopkins, Baltimore, 1965.
Traffic in Towns. Penguin Special, 1963.

GEOGRAPHY II

First session

Urban Location and Structure

Urban centres vary from vast, sprawling agglomerations to compact, orderly country towns. This subject attempts to introduce the student to the hypotheses, theories and techniques of urban analysis which shed light on the organisation, structure and function of urban centres. There are four major discussion areas in the subject—intra-urban spatial structure, urban mobility, people in the urban system and systems of cities.

TEXTBOOKS

Berry, B. J. L. & Horton, F. E. *Geographic Perspectives on Urban Systems.* Prentice-Hall, N.Y., 1970.
Bourne, L. S. *Internal Structure of The City.* Readings on Space and Environment. Oxford, 1972.

REFERENCE BOOKS

Chapin, F. S. *Urban Land Use Planning.* Illinois, U.P., 1955.
Chapin, F. S. & Weiss, S. F. *Urban Growth Dynamics.* Wiley, N.Y., 1962.
Chinitz, B. *City and Suburb: The Economics of Metropolitan Growth.* Prentice-Hall, N.J., 1964.
Christaller, W. *Central Places in Southern Germany*, trans. C. W. Baskin. Prentice-Hall, N.Y., 1966.
Cities. Scientific American. Penguin. Paperback.
Clark, N. ed. *Analysis of Urban Development.* Proceedings of the Tewksbury Symposium, University of Melbourne, 1970.
Horton, F. ed. *Geographic Studies of Urban Transportation and Network Analysis.* N.W. University Studies in Geography No. 16. Evanston, 1968.
IGU Symposium in Urban Geography. University of Lund, 1962.
Johnston, R. J. *Urban Residential Patterns.* 1971.
Marshall, J. U. *The Location of Service Towns.* University of Toronto, Department of Geography, Res. Pub. 5, 1969.
Mayer, H. M. & Kohn, C. F. *Readings in Urban Geography.* University of Chicago, 1959.
Meyer, J. R., Kain, J. F. & Wohl, M. *The Urban Transportation Problem.* Harvard U.P., 1969.
Meier, R. L. *A Communication Theory of Urban Growth.* Cambridge, 1962.
Murphy, R. E. *The American City, An Urban Geography.* McGraw-Hill, N.Y., 1966.

National Capital Development Commission. *The Future Canberra.* Angus & Robertson, Sydney, 1970.
Perloff, H. S. & Wingo, L. *Issues in Urban Economics.* Johns Hopkins, Maryland, 1968.
Troy, P. N. ed. *Urban Redevelopment in Australia.* A.N.U. Press, 1967.
Wilkes, J. ed. *Australian Cities: Chaos or Planned Growth.* Angus & Robertson, 1966.
Wilson, J. Q. *The Metropolitan Enigma.* Doubleday, N.Y., 1970.

Quantitative Methodology

This subject attempts to introduce the student to some of the basic quantitative techniques which appear in the contemporary literature of locational analysis. Individual measures, techniques, etc. are oriented to particular examples drawn from current theory and/or practice. Emphasis is on the practical application of the techniques and/or on providing an adequate understanding of the techniques as they are employed in contemporary literature.

REFERENCE BOOKS

Alder, H. L. & Roessler, E. B. *Introduction to Probability and Statistics.* Freeman, San Francisco, 1968.
Allendoerfer, C. B. & Oakley, C. *Fundamentals of Freshman Mathematics.* McGraw-Hill, Sydney, 1968.
Berry, B. J. L. & Marble, D. F. *Spatial Analysis: A Reader in Statistical Geography.* Prentice-Hall, N.Y., 1968.
Cole, J. P. & King, C. A. M. *Quantitative Geography.* Wiley, London, 1968.
Dixon, W. J. & Massey, F. J. *Introduction to Statistical Analysis.* McGraw-Hill, N.Y., 1969.
Gregory, S. *Statistical Methods and the Geographer.* Humanities Press, N.Y., 1968.
Haggett, P. *Locational Analysis in Human Geography.* Arnold, London, 1965.
King, L. J. *Statistical Analysis in Geography.* Prentice-Hall, N.J., 1969.
Moloney, M. J. *Facts from Figures.* Pelican, 1963.
Yeates, M. H. *An Introduction to Quantitative Analysis in Economic Geography.* McGraw-Hill, N.Y., 1968.
Yeomans, K. A. *Introductory Statistics: Statistics for the Social Scientist.* Vols. 1 and 2. Penguin.

GEOGRAPHY II

Second session

Biogeography

This subject adopts the ecological approach to the study of vegetation communities and considers the inter-relationship between climate, soil, vegetation and fauna. Systematic studies are made of plant requirements and processes in plant growth, and of the role of energy flow and biogeochemical cycling in the functioning of ecosystems; case studies are chosen from Australia and elsewhere, of vegetation communities in relation to climate, landforms and soil. The foregoing principles are further applied to studies of conservation, and of trace element contamination in the soil/plant system.

TEXTBOOKS

Daubenmire, R. F. *Plants and Environment.* Wiley, N.Y., 1959.
Odum, E. *Ecology.* Holt, Rinehart & Winston, N.Y., 1963.
Watts, D. *Principles of Biogeography: an introduction to the functional mechanisms of ecosystems.* McGraw-Hill, London, 1971.

REFERENCE BOOKS

Billings, W. D. *Plants and the Ecosystem.* Macmillan, London, 1965.
Barnard, C. *Grasses and Grasslands.* Macmillan, London, 1964.
Buckman, H. O. & Brady, N. C. *The Nature and Properties of Soils.* Macmillan, 1968.
Corbett, J. R. *The Living Soil.* Martindale Press, Sydney, 1969.
Eyre, S. R. *Vegetation and Soils.* Arnold, London, 1963.
Fogg, G. E. *The Growth of Plants.* Penguin, London, 1963.
Kormondy, E. J. *Concepts of Ecology.* Prentice-Hall, 1969.
Nye, R. H. & Greenland, D. J. *The Soil Under Shifting Cultivation.* Technical Communication No. 51, British Commonwealth Agricultural Bureau. Farnham Royal, Harpenden, 1960.
Odum, E. *Fundamentals of Ecology.* Saunders, Philadelphia, 1966.
Oosting, H. J. *Study of Plant Communities.* Freeman, San Francisco, 1956.
Russell, E. J. *World of Soil.* Collins, London, 1961.
Russell, J. & Russell, E. W. *Soil Conditions and Plant Growth.* Longmans, London, 1966.
Tivy, J. *Biogeography: a study of plants in the ecosphere.* Oliver & Boyd, London, 1971.

Regional Geography

This subject considers the regional concept and method in geography, and will deal with characteristics and attributes of regions, regional construction, economic regions, and detailed treatment of some specific regions of South-east Asia and South Asia.

TEXTBOOKS

Fryer, D. W. *Emerging Southeast Asia.* George Philip & Sons, London, 1970.
Spencer, J. E. *Asia South-by-East.* John Wiley & Sons, N.Y., 1971.

REFERENCE BOOKS

Abler, R., Adams, J. S. & Gould, P. *Spatial Organization: A Geographer's View of the World.* Prentice-Hall, 1971.
Bunge, W. *Theoretical Geography.* The Royal University of Lund, 1962.
Chorley, R. J. & Haggett, P. *Models in Geography.* Methuen, London, 1967.
Dobby, E. H. *Southeast Asia.* London U.P., 1969.
Hartshorne, R. *Perspective on the Nature of Geography.* John Murray, London, 1960.
James, P. E. & Jones, C. F. *American Geography: Inventory and Prospects.* Syracuse U.P., 1959.
Needleman, L. ed. *Regional Economic Analysis.* Penguin, Harmondsworth, 1968.
Norse, H. O. *Regional Economics.* McGraw-Hill, N.Y., 1968.

GEOGRAPHY II HONOURS

First session

Urban Location and Structure

This subject consists of *Urban Location and Structure* as prescribed for the pass course plus additional and more advanced work.

TEXTBOOKS AND REFERENCE BOOKS

As for the pass course in *Urban Location and Structure.*

Quantitative Methods

This subject consists of *Quantitative Methods* as prescribed for the pass course plus additional and more advanced work.

REFERENCE BOOKS

As for the pass course in *Quantitative Methods.*

GEOGRAPHY II HONOURS

Second session

Biogeography

This subject consists of *Biogeography* as prescribed for the pass course plus additional and more advanced work.

TEXTBOOKS AND REFERENCE BOOKS

As for the pass course in *Biogeography.*

Regional Geography

This subject consists of *Regional Geography* as prescribed for the pass course plus additional and more advanced work.

TEXTBOOKS AND REFERENCE BOOKS

As for the pass course in *Regional Geography.*

For all Geography II Honours subjects the extra reading depends mainly on published papers.

GEOGRAPHY IIIA PASS

First session

Soil Studies

This subject consists of three parts:

1. Scientific background to soil studies to provide an introduction to (2) and (3) below.
2. Pedological studies with special reference to Australian great soil groups.
3. Applied studies in soil conservation, productivity, and land capability.

Practical work will be an integral part of this subject. It comprises a series of laboratory experiments in (1) above, and field tutorials and soil cartography in (2) and (3).

TEXTBOOK

Buckman, H. O. & Brady, N. C. *The Nature and Properties of Soils.* Macmillan, N.Y., 1968.

REFERENCE BOOKS

Baver, L. D. *Soil Physics.* Wiley, N.Y., 1966.
Bear, F. E. ed. *Chemistry of the Soil.* Reinhold, N.Y., 1965.
Burnham, C. P. & Mackney, D. *The Soils of the Church Stretton District of Shropshire.* Agr. Res. Council, Harpenden, 1966.
Clarke, G. R. *The Study of Soil in the Field.* 4th ed. O.U.P., 1957.
Corbett, J. R. *The Living Soil.* Martindale, Sydney, 1969.
Duchaufour, P. *Précis de Pedologie.* Masson à Cie, Paris, 1967.
Hall, Sir D. *The Soil,* rev. G. W. Robinson. Murray, 1945.
Leeper, G. W. *Introduction to Soil Science.* Melbourne, U.P., 1964.

Marshall, J. J. *Relations Between Water and Soil.* Technical Communication No. 50, British Commonwealth Agricultural Bureau. Farnham Royal, Harpenden, 1959.
Millar, C. E., Turk, L. M. & Foth, H. D. *Fundamentals of Soil Science.* 4th ed. Wiley, 1966.
Nye, P. H. & Greenland, D. J. *The Soil under Shifting Cultivation.* Technical Communication No. 51, British Commonwealth Agricultural Bureau. Farnham Royal, Harpenden, 1960.
Prescott, J. A. & Pendleton, R. L. *Laterite and Lateritic Soils.* Technical Communication No. 47, British Commonwealth Agricultural Bureau. Farnham Royal, Harpenden, 1966.
Rose, C. W. *Agricultural Physics.* Pergamon, Sydney, 1966.
Russell, Sir E. J. *World of the Soil.* Fontana, 1967.
Russell, Sir E. J. *Soil Condition and Plant Growth.* 9th ed. Longmans, London, 1963.
Slatyer, R. O. *Plant Water Relationships.* Academic Press, London, 1967.
Soil Survey Staff United States Department of Agriculture Handbook No. 18. *Soil Survey in the Field.*
Soil Survey Staff United States Department of Agriculture Handbook No. 216. *Land Capability.*
Stace. H. L. T. et al. *A Handbook of Australian Soils.* Rellim, 1968.
Stephens, C. G. *A Manual of Australian Soils.* CSIRO, 1962.

GEOGRAPHY IIIA PASS

Second session

Geomorphology

This subject consists of: processes in the evolution of hillslopes, stream channels and valley forms, shorelines, and arid features; lithological, structural and temporal controls in landscape development; application of these principles to morphogenetic landscape studies with special reference to Australian examples.

TEXTBOOKS

Morisawa, M. *Streams, their Dynamics and Morphology.* McGraw-Hill, 1968.
Twidale, C. R. *Structural Geomorphology.* A.N.U., 1971.

REFERENCE BOOKS

Bird, E. C. F. *Coasts.* A.N.U. Press, 1968.
Chorley, R., Dunn, A. & Beckinsale, R. *The History of the Study of Landforms.* Vol. 1. Methuen, London, 1964.
Davis, W. M. *Geographical Essays.* Doyer, N.Y., 1954.
Dury, G. *Face of the Earth.* Penguin, 1959.
Hettner, A. *Die Oberflachenformen Des Festlandes*, trans. P. Tilley. In Press.
Jennings, J. N. & Mabbutt, J. A. *Landform Studies From Australia and New Guinea.* A.N.U. Press, 1972. Paperback.
Leopold, L. B., Wolman, M. G. & Miller, J. P. *Fluvial Processes in Geomorphology.* Freeman, 1964.
Mather, K. & Mason, S. *A Source Book in Geology.* Hafner, N.Y., 1964.
Penck, W. *Morphological Analysis of Landforms*, trans. H. Czech and K. Boswell. Macmillan, London, 1963.
Pitty, A. F. *Introduction to Geomorphology.* Methuen, 1971.
Playfair, J. *Illustrations of the Huttonian Theory of the Earth.* Dover, N.Y., 1964.
Thornbury, W. D. *Principles of Geomorphology.* Wiley, 1954.
Twidale, R. *Geomorphology.* Nelson, 1968.

GEOGRAPHY IIIB PASS

First session

Agricultural Geography

This subject deals with origin, dispersals, and basis of agriculture; models of location of agricultural activity; agricultural structure and typology; measurements of various agricultural attributes (intensity, productivity, concentration and diversification); sampling and representative farms in agricultural geography; regional comparisons in farm structure; studies in agricultural change; agriculture in selected countries; and diffusion of innovation in agriculture.

TEXTBOOKS

Barlowe, R. *Land Resource Economics.* Prentice-Hall, 1971.
Fouvel, W. C. *A Theoretical Approach to Rural Land-Use Patterns.* Arnold, London, 1971.

REFERENCE BOOKS

Anderson, J. R. *A Geography of Agriculture.* W. M. C. Brown & Co., Iowa, 1970.
Boserup, E. *The Conditions of Agricultural Growth: The Economics of Agrarian Change Under Population Pressure.* Allen & Unwin, London, 1970.
Chrisolm, M. *Rural Settlement and Land Use.* Hutchinson, London, 1966.
Cohen, R. *The Economics of Agriculture.* C.U.P., 1968.
Cook, R. U. & Johnson, J. H. eds. *Trends in Geography.* Pergamon, Oxford, 1969.
Grigg, D. *The Harsh Lands.* Macmillan, London, 1970.
Hall, P. ed. *Von Thunen's Isolated State.* Pergamon, Oxford, 1969.
Institute of British Geographers. *Land Use Resources: Studies in Applied Geography.* Special Publication No. 1. Nov., 1968.
Morgan, W. B. & Mutton, J. C. *Agricultural Geography.* Methuen, London, 1971.
Roepke, H. G. *Readings in Economic Geography.* John Wiley & Sons, N.Y., 1967.
Sauer, C. O. *Agricultural Origins and Dispersals.* Amer. Geog. Soc., N.Y., 1952.
Smith, R. H. T., Taaffe, E. J. & King, L. J. *Readings in Economic Geography: The Location of Economic Activity.* Rand McNally, 1968.
Southworth, H. M. & Johnston, B. F. *Agricultural Development and Economic Growth.* Cornell U.P., N.Y., 1967.
Spencer, J. E. & Thomas, W. L. *Cultural Geography.* John Wiley & Sons, N.Y., 1969.
Stamp, L. D. *Our Developing World.* Faber & Faber, London, 1969.
Williams, B. D. *Agriculture in Australian Economy.* Sydney U.P., 1967.

GEOGRAPHY IIIB PASS

Second session

Geography of Transport Systems

This subject considers the significance of transport systems in structuring spatial patterns. Discussion will be focused on a number of aspects including some of the following:

(i) Distance, movement and location theory.
(ii) Network location, structure and measurement; terminal location morphology.
(iii) Rating, spatial patterns and intermodal competition.

(iv) Movement, gravity and interaction models.

(v) Intra-urban transport, traffic and land use.

(vi) Transport and economic development.

TEXTBOOKS

Blunden, W. R. *The Land Use Transport System: Analysis and Synthesis.* 1971.

Traffic in Towns. Penguin, U.K., 1964.

REFERENCE BOOKS

Clark, N. ed. *Analysis of Urban Development.* Proceedings of the Tewksbury Symposium, University of Melbourne, 1970.

Garrison, W. L. & Marble, D. F. eds. *Quantitative Geography.* Part 1. Economic and Cultural Topics, Northwestern University Studies in Geography, No. 13. Evanston, 1967.

Haggett, P. *Locational Analysis in Human Geography.* Arnold, London, 1965.

Haggett, P. & Chorley, R. J. *Network Analysis in Geography.* Arnold, London, 1969.

Horton, F. ed. *Geographic Studies of Urban Transportation and Network Analysis.* Northwestern University Studies in Geography, No. 16. Evanston, 1968.

Isard, W. *Location and Space Economy.* MIT Press, Cambridge, 1956.

Kansky, K. J. *Structure of Transportation Networks.* University of Chicago, Research Paper No. 84. 1963.

Kolsen, H. M. *The Economics and Control of Road-Rail Competition.* Sydney U.P., 1968.

Meyer, J. R., Kain, J. F. & Wohl, M. *The Urban Transportation Problem.* Harvard U.P., Cambridge, 1969.

Munby, D. *Transport, Selected Readings.* Penguin, Harmondsworth, 1968.

Olsson, G. *Distance and Human Interaction, A Review and Bibliography.* Regional Science Research Institute Bibliography Series, No. 2. Philadelphia, 1965.

Sealy, K. R. *The Geography of Air Transport.* Hutchinson, London, 1968.

Smerk, G. M. ed. *Readings in Urban Transportation.* Indiana U.P., Bloomington, 1968.

Starkie, D. N. M. *Traffic and Industry.* London School of Economics and Political Science, Geographical Papers No. 3. 1969.

Wolforth, J. W. *Residential Location and the Place of Work.* B.C. Geographical Series, No. 4. Vancouver, 1965.

GEOGRAPHY IIIA HONOURS

First session

Soil Studies

This subject consists of *Soil Studies* as prescribed for the pass course plus additional and more advanced work in pedological and applied studies.

TEXTBOOKS

As for the pass course in *Soil Studies* plus:

Clarke, G. R. *The Study of Soil in the Field.* 4th ed. O.U.P., 1957.

Soil Survey Staff U.S.D.A. Handbook No. 18. *Soil Survey Manual.* Govt. Printing Office, Washington, 1951.

REFERENCE BOOKS

As for the pass course in *Soil Studies.*

Additional reading for honours will depend mainly on published papers.

GEOGRAPHY IIIA HONOURS

Second session

Geomorphology

This subject consists of *Geomorphology* as prescribed for the pass course plus additional and more advanced work in classical and contemporary geomorphic research.

TEXTBOOKS

As for the pass course in *Geomorphology* plus:

Chorley, R., Dunn, A. & Beckinsale, R. *The History of the Study of Landforms.* Vol. 1. Methuen, London, 1964.

REFERENCE BOOKS

As for the pass course in *Geomorphology.*

Additional reading for honours will depend mainly on published papers.

GEOGRAPHY IIIB HONOURS

First session

Agricultural Geography

This subject consists of *Agricultural Geography* as prescribed for the pass course plus additional and more advanced work on current trends in agricultural geography.

TEXTBOOKS

As for the pass course in *Agricultural Geography* plus:

Alonso, E. *Location and Land Use.* Harvard U.P., 1964.

Gregor, H. F. *Geography of Agriculture: themes in research.* Prentice-Hall, 1970.

REFERENCE BOOKS

As for the pass course in *Agricultural Geography.*

Additional reading for honours will depend mainly on published papers.

GEOGRAPHY IIIB HONOURS

Second session

Geography of Transport Systems

This subject consists of *Geography of Transport Systems* as prescribed for the pass course plus additional and more advanced work in urban transport and traffic, and in marine transport and port systems.

TEXTBOOKS

As for the pass course in *Geography of Transport Systems* plus:

Meyer, J. R., Kain, J. F. & Wohl, M. *The Urban Transportation Problem.* Harvard U.P., Cambridge, 1969.

Munby, D. *Transport, Selected Readings.* Penguin, Harmondsworth, 1968.

REFERENCE BOOKS

As for the pass course in *Geography of Transport Systems.*

Additional reading for honours will depend mainly on published papers.

GEOGRAPHY IV HONOURS

Double session subject

It is proposed that Geography IV Honours shall consist of three major parts: the thesis, a general course for all students, and a special area course. Geography IV Honours will include an average of two lecture periods a week. Special seminars and field study will be arranged as required.

1. The thesis topic and title must be approved by the Head of the Department, and the length of the thesis shall not exceed 20,000 words.

2. A general course for all Honours IV students consisting of:
   (i) methods and sources in research,
   (ii) geographical thought and its development.

REFERENCE BOOKS

The reading for this course will largely involve published papers, but basic texts will be:

Chorley, R. & Haggett, P. *Models in Geography.* Methuen, London, 1967.
Haggett, P. *Locational Analysis in Human Geography.* Arnold, London, 1965.
Hartshorne, R. *The Nature of Geography.* Assoc. Amer. Geogers., 1959.
Harvey, D. *Explanation in Geography.* Arnold, London, 1969.
Woolridge, S. W. & East, G. *Spirit and Purpose of Geography.* 1951.

3. Each student takes a course in the wider field within which his thesis topic is selected. A course will consist of one or more of the following topics (in a special case, a course may be given in another area, subject to facilities and staff being available).

Physical Geography

Principles and methods of soil survey; use of air photos in the prediction of soil type and soil properties; problems of soil definition and classification; developments in experimental pedology with reference to specific soil types and/or process; practical application of a system or systems of land capability classification (this would normally involve the consideration of a small, diverse area); influence of climate and soil on plant growth; nutrient cycles; a geographical approach to the study of landforms, which is concerned primarily with the meaning of distribution of phenomena; historical analysis in landform studies, relationships between timeless and timebound concepts; systems theory in geomorphology; empiric and rational methods of investigation, particular reference will be given to papers by Mackin; concepts of indeterminancy.

Economic Geography

Choice of farming systems and decision making models; spatial measurements in agricultural productivity; spatial equilibrium models; regional programming of agriculture; agricultural marketing systems; patterns of technological change in agriculture; intra-urban transport; intra-urban residential mobility; land value and residential locations; intra-urban retail and commercial structure; port morphology (in particular the application of factor analytic and/or Markov chain models to the structure of ports); port capacity (queuing models and the definition of optimal port capacities, simulation models); port hinterland systems.

REFERENCES

References are almost exclusively from journals and similar publications.

GEOLOGY

Geology IW

UNIT A. Introductory Geology, Crystallography, Mineralogy, Petrology.

First session subject (3 hrs. lectures and 3 hrs. practical per week).

Geology as a science, geological time, the earth in space, shape of the earth, astrogeology. Earthquakes and earth structure, orogenesis and epeirogenesis, and volcanoes. The geological cycle.

Crystallography: Crystal symmetry, crystal forms, crystal systems, stereographic projection, twinning.

Mineralogy: Occurrence, form and physical properties of minerals. Mineral classification of silicates. Descriptive minerology of the rock-forming minerals (essentially the silicates).

Petrology: Field occurrence, lithological characters, classification and structural relationships of igneous, sedimentary and metamorphic rocks.

Economic Geology: Descriptive mineralogy of minerals of economic importance. Occurrence of ore deposits, coal and petroleum geology.

Practical Work: Study of crystal models in clinographic and stereographic projection. Identification and description of common minerals and rocks in hand-specimen. At least one field tutorial.

UNIT B. Physical Geology, Palaeontology and Stratigraphy.

Second session subject (3 hrs. lectures and 3 hrs. practical per week).

Physical Geology: The main surface features of the earth. Surface and subsurface water. Weathering and the geological cycle. Lakes, rivers, glacial phenomena. Introductory physiography, including arid land and coastal processes. Folding and faulting in the crust.

Stratigraphy and Palaeontology: Basic principles of stratigraphy. Introductory palaeontology, especially the morphology of the main invertebrate animal and plant phyla. The geological history of the Australian continent and more specifically that of the Sydney Basin and New South Wales.

Practical Work: Recognition and description of examples of important fossil groups and their use in stratigraphy. Interpretation and preparation of geological maps and cross-sections. Map reading and the use of simple geological instruments. At least one field tutorial.

TEXTBOOKS

For Unit A and Unit B.

Read, H. H. & Watson, J. *Introduction to Geology*. 2nd ed. Macmillan, 1968.

or

Gilluly, J., Waters, A. C. & Woodford, A. O. *Principles of Geology*. 3rd ed. Freeman, 1968.

Wollongong Sheet Geological Map. 1:250,000. Mines Dept., N.S.W.

Glasson, K. R. & McDonnell, K. S. *Graded Exercises in Geological Mapping*. Cheshire, Melbourne, Canberra, Sydney. (Not required for Unit A).

REFERENCE BOOKS

Black, R. M. **Elements of Palaeontology*. C.U.P., 1970.

Brown, D. A., Campbell, K. S. W. & Crook, K. A. W. **The Geological Evolution of Australia and New Zealand.* Pergamon, 1968.

Ernst, W. G. *Earth Materials.* Foundations of Earth Science Series. Prentice-Hall, 1969.

Longwell, G. R., Flint, R. F. & Sanders, J. *Physical Geology*. John Wiley, 1969. Student Edition.

Mason, B. & Berry, L. G. **Elements of Mineralogy.* Freeman, 1968.
or
Hurlbut, C. S., Jr. *Dana's Manual of Mineralogy.* 18th ed. John Wiley, 1971.
Phillips, F. C. **An Introduction to Crystallography.* 4th ed. Longmans, 1971.
Skinner, B. J. *Earth Resources.* Foundations of Earth Science Series. Prentice-Hall, 1969.
Tarling, D. H. & Tarling, M. P. *Continental Drift—A Study of the Earth's Moving Surface.* Penguin, 1972.
Twidale, C. R. *Geomorphology.* Nelson, 1968.
Verhoogen, J. *et al.* **The Earth—An Introduction to Physical Geology.* Holt, Rinehart & Winston, 1970.
* The purchase of these books is suggested for students who intend to proceed to later units in Geology.

Geology IIW

UNIT A. Crystallography, Crystal Chemistry and Mineralogy.

First session subject (2 hrs. lectures and 4 hrs. practical per week).
Crystallography: Stereographic projection, Wulff net. Crystal classes and point groups. Bravais lattices. Zones, zone law. Internal symmetry, space groups. Use of spherical triangles. Napierian triangles. Introduction to X-ray diffraction.

Optical Crystallography: Properties of waves, refraction in isotropic and anisotropic media. Refractive indices. Uniaxial and biaxial indicatrices and crystals. Use of the petrological microscope. Interference colours and extinction. Biot-Fresnel construction, uniaxial and biaxial interference figures.

Practical: A laboratory study of the optical properties of minerals using the petrological microscope.

Crystal Chemistry: Chemical composition and unit cell content. Components and phases. The bonding of atoms, the effect of ionic radius on structure. Isomorphism, atomic substitution and solid solution. Polymorphism. Pseudomorphism. Non-crystalline minerals. Classification of minerals.

Economic Minerals: The application of the principles of crystal chemistry to the following mineral classes: native elements, sulphides, oxides, halides, carbonates, sulphates and phosphates.

Practical: A study of economic minerals in hand-specimen.

Silicate Minerals: The application of the principles of crystal chemistry to, and a study of, the physical and chemical properties of the silicate minerals.

Practical: A study of silicates in hand-specimen and thin-section.

TEXTBOOKS

Deer, W. A., Howie, F. A. & Zussman, J. *An Introduction to the Rock-forming Minerals.* Longmans, 1966.
Kerr, P. F. *Optical Mineralogy.* 3rd ed. McGraw-Hill, 1959.
Mason, B. & Berry, L. *Elements of Mineralogy.* Freeman, 1968.
Phillips, F. C. *An Introduction to Crystallography.* 4th ed. Longmans, 1971.

REFERENCE BOOKS

Bloss, F. D. *An Introduction to the Methods of Optical Crystallography.* Holt, Rinehart & Winston, 1961.
Bloss, F. D. *Crystallography and Crystal Chemistry.* Holt, Rinehart & Winston, 1971.
Phillips, W. R. *Mineral Optics.* Freeman, 1971.
Wahlstrom, E. E. *Optical Crystallography.* 4th ed. Wiley, 1968.

UNIT B. Petrology.

Second session subject (2 hrs. lectures and 4 hrs. practical per week).

Igneous: Classification of rocks. Characteristics and classification of igneous rocks. Petrochemical calculations. Variations in associated igneous rocks. The consolidation of magma and a study of some synthetic silicate systems. Reaction series in igneous rocks. Some igneous rock associations.

Metamorphic: Characteristics and classification of metamorphic rocks. Definition and types of metamorphism. Factors of metamorphism, the concept of metamorphic facies. Graphical representation of metamorphic mineral paragenesis. Hornfels facies of contact metamorphism. Regional metamorphism. Facies series. Change of chemical composition of minerals with progressive metamorphism. Burial metamorphism.

Sedimentary: Composition of sediments. Textures of clastic rocks. Textures of carbonate rocks. Classification of sedimentary rocks. Description of main groups of sedimentary rocks. Diagenesis.

Practical: Study of rocks in hand-specimen and thin-section.

TEXTBOOK

Williams, H., Turner, F. J. & Gilbert, C. M. *Petrography.* Freeman, 1955.

REFERENCE BOOKS

Bayly, B. B. *Introduction to Petrology.* Prentice-Hall, 1968.

Hatch, F. H., Wells, A. K. & Wells, M. K. *Petrology of the Igneous Rocks.* 12th ed. Murby, 1961.

Turner, F. J. & Verhoogen, J. *Igneous and Metamorphic Petrology.* 2nd ed. McGraw-Hill, 1960.

UNIT C. Palaeontology, Stratigraphy and Sedimentation.

First session subject (3 hrs. lectures and 3 hrs. practical per week).

Palaeontology: Taxonomy, evolution, species concepts. Systematic treatment of the more important invertebrates — morphology, classification, phylogeny, ecology, geological distribution. Study of demonstrations to illustrate the lecture course.

Stratigraphy and Sedimentation: Minerals of sedimentary rocks. Particle size, frequency and cumulative diagrams, measures of central tendency, sorting, skewness, kurtosis. Particle shape and surface texture. Mass and vectorial properties of sediments, grain fabric. Sedimentary processes. Diagenesis. Pourbaix diagrams. The stratigraphy of selected areas in Australia.

TEXTBOOKS

Black, R. M. *Elements of Palaeontology.* C.U.P., 1970.

Krumbein, W. C. & Sloss, L. L. *Stratigraphy and Sedimentation.* 2nd ed. Freeman, 1963.

Middlemiss, F. A. *A Guide to Invertebrate Fossils.* Hutchinson, 1968. (Only recommended for students not proceeding to further geology courses).

Raup, D. A. & Stanley, S. M. *Principles of Paleontology.* Freeman, 1971.

REFERENCE BOOKS

Brown, D. A., Campbell, K. S. W. & Crook, K. A. W. **The Geological Evolution of Australia and New Zealand.* Pergamon, 1968.

Moore, R. C. ed. *Treatise on Invertebrate Paleontology.* Geol. Soc. Amer.

Packham, G. H. ed. *The Geology of N.S.W.* Jour. Geol. Soc. Australia. Vol. 16 Part 1, 1969, pp. 1-645.

* The purchase of these books is suggested for students who intend to proceed to later units in Geology.

UNIT D. Elements of Geological Mapping.

Second session subject (1 hr. lectures, 1½ hrs. practical per week and up to a total of 10 days of field work).

Course Description: Introductory lecture and practical course-work. Field mapping tutorial, held during a vacation. Students will map in detail the geology of a selected area. Map compilation and progress reports on each day's work with final interpretation of results in the laboratory tutorials after completion of the field tutorial.

REFERENCE BOOKS

Kottlowski, F. E. *Measuring Stratigraphic Sections.* Holt, Rinehart & Winston, 1965.

Ragan, D. *Structural Geology — An Introduction to Geometrical Techniques.* Wiley, 1968.

Geology IIIW

It should be noted that all units may not be offered in any one year. A list of units on offer can be obtained from the Head of the Department.

UNIT A. Crystallography, Mineralogy, Igneous and Metamorphic Petrology.

First session subject (2 hrs. lectures and 4 hrs. practical per week).

Optical Crystallography: Oil immersion techniques and mineral determination by dispersion in refractive index liquids. The universal stage, feldspar determination, location of vibration axes, optic axes and 2V measurement, determination of extinction angles.

X-ray Mineralogy: Theory and practice of X-ray instrument techniques, powder photographs, cell dimensions.

Crystal Chemistry: Solid-solid phase transitions, transformations of secondary co-ordination, transformations of primary co-ordination, transformations of the bond type, transformations of order-disorder, order-disorder reactions and the feldspars. Phase transitions at high pressures. Crystal chemistry of the pyroxenes or amphiboles. Crystal pathology. Aluminium silicates in metamorphism.

Petrology: Rock kindreds. Concept of primary and derivative magmas, crustal anatexis, magma generation in the upper mantle, partial melting. Tholeiitic, alkaline olivine basalt and high alumina basalt magmas, the basalt tetrahedron. The shoshonite magma. The calc-alkali association. For a more detailed study: Crystallisation of tholeiitic magma, alkali-basalt magma and derivative rocks. Rocks of the shoshonite magma association. High-alumina basalt. Ultramafic rocks. The calc-alkali magma and granitic rocks. Orogenic vulcanicity. The gabbro-eclogite transformation. Lunar basalts.

Types of metamorphism. Metamorphic zones, facies, facies series. Metamorphic reactions in carbonate rocks. Hornfelses. Zeolite, greenschist, blueschist and amphibolite facies. Granulites, eclogites and garnet peridotites. Metasomatism. Polymetamorphism.

Practical: Determination of unknown mineral grains by immersion techniques. Exercises involving use of the universal stage. Determination of crystal class and cell dimensions from powder photographs. The study of igneous and metamorphic rocks and rock suites in hand-specimen and thin-section.

TEXTBOOKS

Turner, F. J. & Verhoogen, J. *Igneous and Metamorphic Petrology.* 2nd ed. McGraw-Hill, 1960.

Winkler, H. *Petrogenesis of Metamorphic Rocks.* 2nd ed. Springer-Verlag, 1967.

REFERENCE BOOKS

Hess, H. H. & Poldervaart, A. eds. *Basalts.* Vols. 1 & 2. Interscience, 1967 and 1968.
Joplin, G. A. *Petrography of Australian Igneous Rocks.* 3rd ed. A. & R., 1971.
Joplin, G. A. *Petrography of Australian Metamorphic Rocks.* A. & R., 1968.
Mehnert, K. *Migmatites and the Origin of Granitic Rocks.* Elsevier, 1968.
Turner, F. J. *Metamorphic Petrology.* McGraw-Hill, 1968.
Wyllie, P. J. ed. *Ultramafic and Related Rocks.* Wiley, 1967.

UNIT B. Geophysics and Statistical Methods in Geology.

First session subject (4 hrs. lectures and 2 hrs. tutorials or practical per week).

Geophysics: Geodesy — study of the shape of the earth, and its gravitational field. Seismology — study of natural (and artificial) earthquake phenomena, and their relation to the structure of the earth and its properties. The earth's near-atmosphere. Geomagnetism and palaeomagnetism. The earth's magnetic field, its characteristics and variations; the history of this geomagnetic field, especially as recorded in rocks and similar material. Solar-planetary relationships. The sun, planets, moon, meteorites and their relationships. Geochronology — methods of radiometric dating and correlation. Geothermy — thermal properties of the earth, heat flow.

TEXTBOOKS

Bullen, K. E. *An Introduction to the Theory of Seismology.* 3rd ed. C.U.P., 1963.
Garland, G. D. *The Earth's Shape and Gravity.* Pergamon, London, 1965.
Strangway, D. W. *The History of the Earth's Magnetic Field.* McGraw-Hill, 1970.
or
Tarling, D. H. *Principles and Applications of Palaeomagnetism.* Chapman & Hall, 1971.
Tucker, R. H. *et al. Global Geophysics.* Eng. U.P. 1970.

REFERENCE BOOKS

Bates, D. R. ed. *The Planet Earth.* 2nd ed. Pergamon, London, 1964.
Howell, B. J. *Introduction to Geophysics.* McGraw-Hill, N.Y., 1959.
McElhinny, M. W. *Palaeomagnetism and Plate Tectonics.* C.U.P., 1973.
Richter, C. E. *Elementary Seismology.* Freeman, 1958.
Runcorn, S. K. *Palaeogeophysics.* Academic Press, 1970.

Statistical Methods of Geology: Scale, mathematical and conceptual geological models. Attributes of types of data, accuracy and precision. Some common geological distributions. Testing of populations to determine distribution. The normal distribution and the significance of moment measures, especially in relation to sediments. Properties of the mean. Hypothesis testing using tests on population means and variances as an illustration of its use in geology. Analysis of variance. Simple and general linear models. Response surface analysis as applied in stratigraphic, chemical and mineralogical data. Classification methods, discriminant functions, factor analysis. Time series analysis. Simulation.

Practical: Preparation of simple computer programmes. Use of library programmes to solve geological problems.

TEXTBOOKS

Harbaugh, J. & Merriam, D. F. *Computer Methods in Geology.* Wiley, 1968.
or
Krumbein, W. C. & Graybill, F. *An Introduction to Statistical Models in Geology.* McGraw-Hill, 1965.

REFERENCE BOOK

Computer Contributions Series of the Geological Survey. Kansas, 1964.

UNIT C. Sedimentary Rocks, Stratigraphy and Stratigraphic Palaeontology, Vertebrate Palaeontology.

Second session subject (3 hrs. lectures and 3 hrs. practical per week).

Sedimentary Rocks: Further studies of sediments, classificatory schemes for sedimentary rocks and post-consolidation changes in sediments. Accessory minerals in sediments. The use of heavy minerals and other features in the study of provenance, including methods of separation of heavy minerals. Clays.

Practical: Study of sedimentary rocks in hand-specimen and thin-section. Heavy mineral and provenance studies.

TEXTBOOKS

Folk, R. L. *Petrology of Sedimentary Rocks.* Hemphill's, 1968.
Milner, H. B. *Sedimentary Petrography.* 3rd ed. Murby, London, 1940.
Pettijohn, F. J. *Sedimentary Rocks.* 2nd ed. Harper, N.Y., 1957.

Stratigraphy and Stratigraphic Palaeontology: Rock, time and time-rock unit concepts. Correlation methods and problems in the Pre-Cambrian and the Phanerozoic. A systematic treatment of the geological columns discussing the type successions together with other important overseas successions and those of representative Australian regions. The history of the Tasman, Caledonian and Alpine and other geosynclines.

Practical: Demonstrations of suites of rocks and fossils from important successions.

Vertebrate Palaeontology: The main features of the major groups in the evolution of the vertebrates.

Practical: Study of morphology of some important groups.

TEXTBOOKS

Brown, D. A., Campbell, K. S. W. & Crook, K. A. W. *The Geological Evolution of Australia and New Zealand.* Pergamon, 1968.
Eicher, D. L. *Geologic Time.* Prentice-Hall, 1968.
Laporte, L. F. *Ancient Environments.* Prentice-Hall, 1968.
Romer, A. S. *Man and the Vertebrates.* 2 vols. Penguin.

REFERENCE BOOKS

Arkell, W. J. *The Jurassic System in Great Britain.* Oxford, 1933.
Arkell, W. J. *The Jurassic System in the World.* Oliver & Boyd, 1956.
Kummel, B. H. *History of the Earth.* 2nd ed. Freeman, 1970.
Rankama, K. ed. *The Pre-Cambrian.* Vols. 1 & 2. Interscience, 1963 and 1965.
Rayner, D. H. *The Geology of the British Isles.* Cambridge, 1957.

UNIT D. Structural Geology and Geotectonics, Economic Geology.

Second session subject (2 hrs. lectures and 4 hrs. practical per week).

Structural Geology and Geotectonics: Non-diastrophic and diastrophic deformation of rocks. Structures, internal and external, associated with igneous rocks. Introduction to structural analysis. Large-scale deformations such as alpine tectonics, and the structure and structural evolution of the European Alps and the Himalayas. Other examples of mountain-building, and geosynclines. Mid-oceanic ridges and associated features.

Practical: Study of deformed rocks in hand-specimen and thin-section. The stereographic projection in structural geology. Map problems.

TEXTBOOKS

Billings, M. P. *Structural Geology.* 3rd ed. Prentice-Hall, 1972.
or
Hills, E. S. *Elements of Structural Geology.* 2nd ed. Chapman & Hall. Science Paperbacks, 1972.
Phillips, F. C. *The Use of Stereographic Projection in Structural Geology.* 2nd ed. Arnold, London, 1960.

REFERENCE BOOKS

DeSitter, L. U. *Structural Geology.* McGraw-Hill, N.Y., 1956.
Ramsay, J. G. *Folding and Fracturing of Rocks.* McGraw-Hill, 1967.
Turner, F. J. & Weiss, L. E. *Structural Analysis of Metamorphic Tectonites.* McGraw-Hill, 1963.

Economic Geology: Outline of the scope of economic geology and of the processes of concentration of economically important minerals. Introduction to some classifications of ore deposits. Description, with examples, of the major types of ore deposits — those contained in igneous rocks, those associated with igneous rocks. Sedimentary ore deposits. Effects of metamorphism in forming new ore deposits, and modifying existing ore deposits. Metallogenic analysis — the distribution of ores in space and time. Appraisal techniques. Australian ore deposits. *Practical:* An introductory course in ore microscopy. The mineragraphy of some important Australian orebodies.

TEXTBOOKS

Edwards, A. B. *Textures of the Ore Minerals and Their Significance.* 2nd ed. Australas. Inst. Min. Metall., Melbourne, 1960.
Stanton, R. L. *Ore Petrology.* McGraw-Hill, 1972.

REFERENCE BOOKS

Barnes, H. L. *Geochemistry of Hydrothermal Ore Deposits.* Holt, Rinehart & Winston, 1967.
Bateman, A. M. *Economic Mineral Deposits.* 2nd ed. Wiley, 1950.
Geology of Australian Ore Deposits. 1st and 2nd ed. (1953 and 1965) Australas. Inst. Min. Metall.
Park, C. F. & MacDiarmid, R. A. *Ore Deposits.* 2nd ed. Freeman, 1970.
Short, M. N. *Microscopic Determination of the Ore Minerals.* U.S. Geol. Surv. Bull. 914, 1940.
Uytenbogaardt, W. & Burke, E. A. J. *Tables for Microscopic Determination of Ore Minerals.* 2nd ed. Elsevier, 1971.

UNIT E. Crystallography, Mineralogy and Petrology and Geochemistry.
Second session subject (2 hrs. lectures and 4 hrs. practical per week).

Crystallography, Mineralogy: An introduction to modern techniques used in crystallography and mineralogy — X-ray diffraction, X-ray fluorescence, electron microscopy, electron probe, spectroscopy, D.T.A., D.T.G.

Theoretical Petrology: The phase rule, systems of one, two and three components. Eutectics and solid solutions. Complex binary systems. Ternary systems. The application of work on synthetic systems to petrology using, for example, systems such as nepheline-kalsilite-silica, quartz-albite-orthoclase-anorthite-water, diopside-forsterite-silica. Experimental work on the melting of natural rocks. Experimental and theoretical petrology as applied to metamorphic rocks. The mineralogical phase rule. Direct determination of equilibrium curves, reactions of synthesis. Use of thermodynamic data. Experimental appraisal of critical metamorphic reactions, reactions in pelitic assemblages, reactions in siliceous dolomitic limestones, experimental data relating to magnesian schists.

Textures of rocks: Structures and textures. The sequence of crystallization in granites, the development of K-feldspar megacrysts and quartz-feldspar intergrowths. Exsolution textures. Textures of basic igneous rocks. Textures of metamorphic rocks.

Practical: Simple experiments using modern instruments especially in regard to silicate melts. Study of suites of rocks in hand-specimen and thin-section. Thin-section studies of rock textures.

Geochemistry: Elements of structural chemistry and some principles of thermodynamics. Structure of the atom, isotopes, radioactivity, ionic size, aggregates of ions, the crystalline state, imperfections in crystals, diffusion in crystals, order-disorder.

Mineralogy of the mantle, experiments at high pressure. Meteorites. Distribution of the elements, the geochemical classification. Carbonate sediments. Free energy. Oxidation potential and Eh-pH diagrams. Evaporites. Geochemical prospecting. Isotope geology.

Practical: Calculation of problems in geochemistry.

TEXTBOOKS

Krauskopf, K. *Introduction to Geochemistry.* McGraw-Hill, 1967.
or
Mason, B. *Principles of Geochemistry.* 3rd ed. Wiley, 1966.
Turner, F. J. *Metamorphic Petrology.* McGraw-Hill, 1968.
or
Turner, F. J. & Verhoogen, J. *Igneous and Metamorphic Petrology.* 2nd ed. McGraw-Hill, 1960.

REFERENCE BOOKS

Barth, T. F. W. *Theoretical Petrology.* 2nd ed. Wiley, 1963.
Krauskopf, K. *Introduction to Geochemistry.* McGraw-Hill, 1967.

UNIT F. Exploration Geophysics, Petroleum and Nuclear Fuels.

Second session subject (2 hrs. lectures and 4 hrs. tutorials and practicals per week).

Exploration Geophysics: Introduction to the theory of the various techniques of Exploration Geophysics, especially with respect to Australia. Seismic methods, reflection and refraction. Potential methods (gravity and magnetic). Electrical and electromagnetic methods — using natural and artificial electrical and electromagnetic fields. Radiometric techniques. Methods of down-hole logging and correlation.

Practical: Calculations of real and imaginary problems based on the theory and interpretation outlined in lectures for various techniques. Study of Australian case histories, in particular, will be made. Field work will be undertaken, depending on the availability of instrumentation.

TEXTBOOKS

Dobrin, M. B. *Introduction to Geophysical Prospecting.* 2nd ed. McGraw-Hill, 1960.
or
Parasnis, D. S. *Mining Geophysics.* Elsevier, 1966.
Griffiths, D. H. & King, R. F. *Applied Geophysics for Engineers and Geologists.* Pergamon, London, 1965.

REFERENCE BOOKS

Grant, F. S. & West, G. F. *Interpretation Theory in Applied Geophysics.* McGraw-Hill, 1965.
Heiland, C. A. *Geophysical Exploration.* Prentice-Hall, Hafner Reprint, 1967.

Petroleum and Nuclear Fuels: Petroleum: History of the use of, and search for, petroleum. The distribution of petroleum in time and space. The generation, migration and accumulation of petroleum, including reservoir rock properties and trap characteristics. Methods of search for and exploitation of, including evaluation of, petroleum deposits. Gas, oil and petroleum solids. Australian occurrences will be described.

Nuclear Fuels: Description of the mineralogy and geology of important nuclear fuel deposits, and related mineral deposits. The methods of searching for such deposits.

Practical: Study of data on Australian petroleum deposits. Description of rotary drill cuttings samples.

TEXTBOOKS AND REFERENCE BOOKS

Lalicker, C. G. *Principles of Petroleum Geology.* Appleton-Century-Crofts, N.Y., 1949.
or
Levorsen, A. I. *Geology of Petroleum.* 2nd ed. Freeman, 1967.
or
Russell, W. L. *Principles of Petroleum Geology.* McGraw-Hill, 1960.
(The reference book for Nuclear Fuels is yet to be selected.)

UNIT G. Basin Analysis, Sedimentation and Oceanography.
First session subject (2 hrs. lectures, 4 hrs. tutorials and practicals per week).

Basin Analysis, Sedimentation and Oceanography: The erosion, transport and deposition of granular solids by fluid media. Flow regimes and their characteristic bed forms. Effects of transport on size distribution. Turbidity currents. Slumping. Reference axes and symmetry concepts. Bedding types and structures. Deformational structures of sedimentary origin. Vectorial properties of sediments, sediment fabrics. Thickness and related maps. The reconstruction of palaeo-environments from sediment properties. The stratigraphy of a number of important Australian and overseas sedimentary basins. Water movements, waves and currents. Physical and chemical properties of sea water. Sediments of the ocean basins. The nature and structure of the ocean floor. Biological oceanography.

Practical: Examination of textures, fabrics and structures of sedimentary rocks in the laboratory. Demonstrations of specimens and maps from some basins covered in lectures. Field examination of sediments (recent and Permian) in the Illawarra District. Experiments with erosion, transport and deposition of sands by water.

TEXTBOOKS

Allen, J. R. L. *Physical Processes of Sedimentation.* Unwin, 1970.
Brown, D. A., Campbell, K. S. W. & Crook, K. A. W. *The Geological Evolution of Australia and New Zealand.* Pergamon, 1968.
Turekian, K. K. *Oceans.* Prentice-Hall, 1968.

REFERENCE BOOKS

Hill, M. N. ed. *The Sea,* 4 vols. Interscience.
Menard, H. W. *Marine Geology of the Pacific.* McGraw-Hill, 1964.
Middleton, G. V. ed. *Primary Sedimentary Structures and their Hydrodynamic Interpretation.* S.E.P.M., 1965.
Pettijohn, F. J. & Potter, P. E. *Atlas and Glossary of Primary Sedimentary Structures.* Springer, 1964.
Potter, P. E. & Pettijohn, F. J. *Paleocurrent and Basin Analysis.* Springer, 1963.

UNIT H. Structural Geology, Geology of Coal.

First session subject (2 hrs. lectures and 4 hrs. practical per week).

Structural Geology: Structural analysis, and further study of folding, including superposed folding. Geometrical, kinematic and dynamic analysis of folded rocks. Stress and strain and its analysis, including determination of the strain ellipsoid. Cleavage and fracture, joint and fault development.

Practical: Problems using the stereographic projection with maps. Advanced stereographic projection problems. Block diagrams. Stress and strain analysis.

TEXTBOOKS AND REFERENCE BOOKS

In addition to those noted for Structural Geology in Unit D of Geology IIIW:

Jaeger, J. C. *Elasticity, Fracture and Flow.* 3rd ed. Methuen, 1969. (Science Paperbacks.)

Price, N. J. *Fault and Joint Development in Brittle and Semi-Brittle Rock.* Pergamon, 1966.

Coal: Formation of peat and coals. Peat-anthracite series. Rank and type concepts. Macerals and microlithotypes. Chemical analysis and technological tests of coals. Minerals in coals. Microscopy of coal products such as cokes and carbons. Geology of coal-bearing sequences.

Practical: Examination of macerals in transmitted and reflected light. Use of immersion to adjust contrast, maceral analyses in reflected light. Measurement of reflectance and of refractive indices using polished sections.

REFERENCE BOOKS

Francis, W. *Coal.* 2nd ed. Arnold, 1961.

International Committee for Coal Petrology. *Glossary of Terms.* 1963. Supplement 1971.

Murchison, D. G. & Westoll, T. S. eds. *Coal and Coal Bearing Strata.* Oliver & Boyd, 1968.

Raistrick, A. & Marshall, C. E. *The Nature and Origin of Coal Seams.* E.U.P., London, 1939. (Out of print).

Van Krevelen, D. W. *Coal, Typology, Chemistry, Physics.* Elsevier, 1961.

UNIT J. Advanced Geological Mapping and Geomorphology.

First session subject (1 hr. lecture and 1½ hrs. practical per week and up to a total of 10 days of field work).

Advanced Geological Mapping: Field work will normally be conducted at the end of the vacation before first session. Students intending to enrol in this unit should consult the Head of the Department during the previous session.

Course Description: Lecture and laboratory tutorial course work will include the use of aerial photographs (including stereoscopic exercises) and satellite photographs in compiling geological maps. The emphasis will be on the use of these techniques in geological map compilation. The field tutorial will be similar to that outlined for Elements of Geological Mapping, but the area selected for field mapping will be more geologically complex.

Final compilation and interpretation will be completed in laboratory tutorials.

Geomorphology: The study of landforms and some other aspects of geomorphology.

Practical: Study of different landforms in stereoscopic pairs of photographs.

REFERENCE BOOKS

Allum, J. A. E. *Photogeology and Regional Mapping.* Pergamon, 1966.
Lahee, F. H. *Field Geology.* 6th ed. McGraw-Hill, 1961.
Lattman, L. & Ray, R. G. *Aerial Photographs in Field Geology.* Holt, Rinehart & Winston, 1965.
Twidale, C. R. *Geomorphology.* Nelson, Melbourne, 1968.

GEOLOGY IV HONOURS

Double session subject

The formal parts of the proposed course will consist of a section on the history of geological thought together with at least two specialist sections chosen from the fields of mineral paragenesis, rock magnetism, biostratigraphy, mathematical geology, coal and petroleum geology. The other parts of the course will be field and laboratory projects, seminars and study of selected references.

TEXTBOOKS

The Head of the Department should be consulted. However, readings in "History of Geological Thought" will be selected from the following:

Adams, F. D. *The Birth and Development of the Geological Sciences.* Dover, 1954 (reprint of 1938 edition).
Cloud, P. *Adventures in Earth History.* Freeman, 1970.
Geikie, A. *The Founders of Geology.* 2nd ed. Dover, 1962 (Reprint of 1905 edition).

HISTORY

History I

Double session subject

English Social History, 1750-1940: During the year emphasis is placed upon economic development, class relationships, education, religion, Victorian respectability and the emergence of the welfare state.

Credit for completion of the first session will be given only after successful completion of the second session.

REFERENCE BOOKS

Best, G. *Mid Victorian Britain, 1851-75.* Weidenfeld & Nicolson, London, 1971. Paperback.
Bottomore, T. B. *Sociology.* Unwin, London, 1967. Paperback.
Breach, R. W. & Hartwell, R. M. *British Economy and Society, 1870-1970.* O.U.P., 1972. Paperback.
Briggs, A. *The Age of Improvement.* Longmans, London, 1960. Paperback.
Carr, E. H. *What is History?* Penguin, London, 1964. Paperback.
Churchill, W. S. *The People's Rights.* Jonathan Cape, London, 1970.
Clark, G. S. R. Kitson. *The Making of Victorian England.* Methuen, London, 1965. Paperback.
Clark, G. S. R. Kitson. *An Expanding Society: Britain, 1830-1900.* M.U.P., 1967. Paperback.
De Schweinitz, K. *England's Road to Social Security.* Barnes, New York, 1961. Paperback.
Eaglesham, E. *Foundations of Twentieth Century Education.* R. & K. P., London, 1967.
Gash, N. *The Age of Peel.* Vol. I. Arnold, London, 1968. Paperback.
Gash, N. *The Age of Peel.* Vol II. Arnold, London, 1972. Paperback.
Halévy, E. A. *A History of the English People in the Nineteenth Century.* Vol 3; *The Triumph of Reform.* Benn, London, 1961. Paperback.
Harrison, J. F. C. *Society and Politics in England, 1780-1960.* Harper, New York, 1965. Paperback.
Harrison, J. F. C. *The Early Victorians, 1832-51.* Weidenfeld & Nicolson, London, 1971. Paperback.
McCord, N. *The Anti-Corn Law League.* Unwin, London, 1968.
McBriar, A. M. *Fabian Socialism and English Politics, 1884-1918.* C.U.P., 1966. Paperback.
Midwinter, E. C. *Nineteenth Century Education.* Longmans, London, 1970. Paperback.
Pelling, H. *A History of British Trade Unionism.* Penguin, London, 1963. Paperback.
Pelling, H. *A Short History of the Labour Party. 2nd ed. Macmillan,* London, 1965.
Perkin, H. *The Origins of Modern English Society, 1780-1880.* R. & K. P., London, 1969. Paperback.
Plumb, J. H. *England in the Eighteenth Century.* Penguin, London, 1950. Paperback.
Rich, E. E. *The Education Act of 1870.* Longmans, London, 1970.
Simon, B. *Studies in the History of Education, 1780-1870.* Lawrence & Wishart, London, 1960.
Simon, B. *Education and the Labour Movement.* Lawrence & Wishart, London, 1965.
Turner, B. *Free Trade and Protection.* Longmans, London, 1971. Paperback.

All students must purchase from the College Bookshop a copy of Harrison, J.F.C. *Society and Politics in England, 1780-1960.* Harper, New York, 1965. Paperback.

History IIA

Double session subject

Russian History 1825-1964: The course is designed to introduce students to certain broad themes of Russian history, while making them thoroughly conversant with the chief events in the history of modern Russia. Class relationships and economic and political development will be emphasized throughout. Session I will be devoted to the history of Tsarist Russia down to 1914. Session II will deal with the rise of Social-Democracy in Russia, the end of the Autocracy and the development of the Soviet Union.

Credit for completion of the first session will be given only after successful completion of the second session.

REFERENCE BOOKS

Aragon, L. *A History of the U.S.S.R.* Weidenfeld & Nicolson, London, 1964.
Billington, J. H. *The Icon and the Axe.* Random House, N.Y., 1969. Paperback.
Blum, J. *Lord and Peasant in Russia from the 9th to the 19th Century.* Princeton U.P., 1971. Paperback.
Dobb, M. *Soviet Economic Development Since 1917.* Routledge & Kegan Paul, London, 1966.
Florinsky, M. T. *Russia: A History and an Interpretation.* Vol. 2. Macmillan, N.Y., 1964.
Harcave, S. *Readings in Russian History.* Vols. 1 & 2. Crowell, N.Y., 1963. Paperback.
Lyashchenko, P. G. *History of the National Economy of Russia to 1917.* Macmillan, N. Y., 1949.
Nettle, J. P. *The Soviet Achievement.* Thames & Hudson, London, 1967. Paperback.
Seton Watson, H. *The Russian Empire, 1801-1917.* O.U.P., London, 1967.
Treadgold, D. W. *Twentieth Century Russia.* Rand McNally, N.Y., 1958.
Westwood, J. N. *Endurance and Endeavour: Russian History 1812-1971.* O.U.P., London, 1973. Paperback.
Venturi, F. *Roots of Revolution: A History of the Populist and Socialist Movements in 19th Century Russia.* Grosset & Dunlap, N.Y., 1964. Paperback.

History IIA (Honours)

A series of classes for second year Honours students will be run throughout the year. Students will submit one 5,000 word paper in each session and one 3,000 word essay in each session. The course will be concerned with the October Revolution of 1917 in Russia. Emphasis will be placed on the causes and consequences of the Revolution, its place in history, the role of Lenin and the extent to which the expectations and fears aroused by the Revolution were realised.

History IIB

Double session subject

Australian Social History: The History IIB programme for the two sessions is as follows:

(a) Australian social history from 1800 to 1890. The principal themes for study are the relations between social classes, demographic change, and social welfare. Study will be based chiefly on the examination of primary records.

(b) Australian social history from 1890 to 1950. The emphasis remains as in session I.

Credit for completion of the first session will be given only after successful completion of the second session.

REFERENCE BOOKS

Appleyard, R. *British Emigration to Australia.* A.N.U. Press, 1964.
Austin, A. G. *Australian Education, 1788-1900.* Pitman, Melbourne, 1961.
Barcan, A. *A Short History of Education in N.S.W.* Martindale, Sydney, 1965.
Beever, M. & Smith, F. B. *Historical Studies: Selected Articles.* Second Series M.U.P., 1967.
Bottomore, T. B. *Sociology.* Allen & Unwin, London, 1962.
Clark, C. M. H. *Selected Documents in Australian History.* Vol. 2. Angus & Robertson, Sydney, 1955.
Ebbels, R. N. *The Australian Labour Movement 1850-1907.* Lansdowne Press, Sydney, 1965. Paperback.
Gollan, R. A. *Radical and Working Class Politics.* A.N.U. Press, 1967. Paperback.
Sawer, G. *Australian Federal Politics and Law, 1901-1929.* M.U.P., 1956.
Sawer, G. *Australian Federal Politics and Law, 1929-1950.* M.U.P., 1963.
Ward, R. B. *The Australian Legend.* O.U.P., Melbourne, 1960.

History IIB (Honours)

This course involves a comparative study of English and Australian Social History during the period 1850-1950. Students will be asked to select particular topics for intensive study.

Students may take either History IIIA or History IIIB or both.

History IIIA

Double session subject

French History

(a) Session I: The chief events in French history from the age of Louis XIV to 1815 with emphasis on the growth of the state; the relationship of state and society; and with particular reference to science, enlightenment and revolution in French history to 1815. The emphasis in this part of the course will be on the relationship of the Enlightenment to the French Revolution.

(b) Session 2: The approach will be the same as in Session I, the only difference being in the period to be covered, namely, from 1815 to 1940. The course will include a detailed study of France in the age of Napoleon III.

REFERENCE BOOKS

Adams, W. E. ed. *The Western World: From 1700.* New York, 1968.
Cassirer, E. *The Philosophy of the Enlightenment.* Boston, 1962. Paperback.
Craig, G. A. *Europe Since 1815.* New York, 1971.
Crocker, L. G. *An Age of Crisis. Man and World in Eighteenth Century French Thought.* Baltimore, 1959.
Denholm, A. *France in Revolution: 1848.* Sydney, 1972.
Dorn, W. L. *Competition for Empire 1740-1763.* Harper & Row, New York, 1964. Paperback.
Halsted, J. B. ed. *December 2, 1851.* New York, 1972.
Harvey, D. J. *France Since the Revolution.* New York, 1968. Paperback.
Kiernan, C. *The Enlightenment and Science in Eighteenth-Century France.* Oxford, 1973.
Lively, J. *The Enlightenment.* London, 1966. Paperback.
Martin, K. *French Liberal Thought in the Eighteenth Century.* London, 1962.
McManners, J. *Lectures in European History, 1789-1914.* Blackwell, Oxford, 1966.

History IIIA (Honours)

French History: The course will concentrate on the question of the relationship of the Enlightenment and the French Revolution of 1789. A comparative study of some eighteenth-century British thought will be included, together with a study of French thought about science and its relationship to Enlightenment and Revolution in France.

History IIIB

Double session subject

Modern Southeast Asian History: The programme for the two sessions is as follows:

(a) One of the main aims during the first session will be to acquaint students with the essential features of selected societies in the region (including a brief analysis of their history before the European impact). Major attention will focus on Indonesia, particularly on social changes induced by Dutch policies, and the rise of nationalism.

(b) During the second session students will study and contrast the colonial policies of Britain, France, and Australia in Malaya, Vietnam and Papua-New Guinea respectively. The emphasis, as before, will be on cultural interaction. The course will conclude with a consideration of some current problems in the region.

REFERENCE BOOKS

Bastin, J. ed. *The Emergence of Modern Southeast Asia, 1511-1957.* Prentice-Hall, N.J., 1967. Paperback.
Bastin, J. & Benda, H. J. *A History of Modern Southeast Asia.* Prentice-Hall, N.J., 1968. Paperback.
Benda, H. J. & Larkin, J. A. *The World of Southeast Asia: Selected Historical Readings.* Harper & Row, New York, 1967. Paperback.
Burling, R. *Hill Farms and Padi Fields.* Prentice-Hall, N.J., 1965. Paperback.
Cady, J. F. *Southeast Asia: Its Historical Development.* McGraw-Hill, New York, 1964.
Chesneaux, J. *The Vietnamese Nation—Contribution to a History.* (trans. M. Salmon). Current Book Distributors, Sydney, 1966. Paperback.
Fitzgerald, F. *Fire in the Lake.* Little-Brown, Boston/Random House, New York/Macmillan, London, 1972. Paperback.
Hall, D. G. E. *A History of Southeast Asia.* 3rd ed. Macmillan, London, 1968. Paperback.
Hudson, W. J. ed. *Australia and Papua-New Guinea.* Sydney U.P., 1971. Paperback.
Legge, J. D. *Indonesia.* Prentice-Hall, N. J., 1964. Paperback.
McVey, R. ed. *Indonesia.* Yale U.P., New Haven, 1963.
Steinberg, D. J. ed. *In Search of Southeast Asia—A Modern History.* Pall Mall, London/Praeger, N.Y., 1971. Paperback.
Winstedt, R. *Malaya and Its History.* 7th ed. Hutchinson, London, 1966. Paperback.

History IIIB (Honours)

Southeast Asian History

This course will involve the use of primary sources, as far as possible, in assessing aspects of the history of Modern Malaya and of Australian New Guinea. On Malaya, attention will be concentrated on British involvement, the nature of indirect rule, and the development of a plural society. On Australian New Guinea, discussion will focus on the transfer of metropolitan concepts and institutions (with their repercussions).

HISTORY AND PHILOSOPHY OF SCIENCE

History and Philosophy of Science I

Double session subject

The Scientific Revolution and the Seventeenth Century: In the seventeenth and early eighteenth centuries, Europeans began to look at the world around them in new ways. New questions were asked and new ways of seeking answers to old questions were developed.

Fundamental changes took place in science in this period: Galileo created a new dynamics; Kepler revised the laws of planetary motion; and Newton, building on their work, set out a radically new theory of the universe. In medicine, anatomy and physiology as well as in philosophy and religion old, established ideas were challenged by Vesalius, Harvey, Bacon, Descartes, Leibniz and many others. Taken all together, the work of these men amounted to an intellectual revolution.

Five groups of topics will be studied:

Bacon and Baconianism: Empiricism; Experimentation and the virtuosi; the Idea of Progress.

Descartes and Cartesianism: Rationalism; the Revival of Atomism; Materialism.

Newton and Newtonianism: the 'New Philosophy'; the implications of the New Dynamics and Astronomy; The Mathematisation of Science.

Science and Religion: the Decline of Superstition and the Growth of Scepticism; the Physico-Theologists; Deism and the Argument from Design.

General Topics: Philosophy and Science; Methodology; the Problem of Certainty; Literature, Language and Science; the Battle of the Ancients and Moderns; the Advent of the Age of Reason.

TEXTBOOKS

Hall, A. R. *From Galileo to Newton 1630-1720.* Collins.
Hall, M. B. ed. *Nature and Natures Laws—Documents of the Scientific Revolution.* Harper.
Kuhn, T. S. *The Copernican Revolution.* Random House.
Kuhn, T. S. *The Structure of Scientific Revolutions.* Phoenix Books.
Smith, P. *Origins of Modern Culture 1543-1687.* Collier.
Smith, P. *The Enlightenment 1687-1776.* Collier.

REFERENCE BOOKS

To be advised during course.

History and Philosophy of Science II

Second session subject

The Darwinian Revolution: The historical and philosophical development of the idea of biological evolution and its impact on Western thought.

Session 1: A general survey of biological thought and practice in the first half of the nineteenth century, considered in the context of its philosophical, religious and social background.

Stress on the application of historical explanation to the biological problems of organic form and formation, leading to the emergence of evolutionary ideas and culminating in the fully-articulated Darwinian theory of evolution.

Session 2: A detailed examination of the Darwinian theory of evolution, its reception and its impact on late nineteenth and early twentieth century religious, social, economic and political ideas.

TEXTBOOKS

Appleman, P. ed. *Darwin—a Norton Critical Edition.* Norton.
Coleman, W. *Biology in the Nineteenth Century.* Wiley History of Science Series.
Darwin, C. *The Origin of Species.* Pelican.
Glass, B. et. eds. *Forerunners of Darwin.* 1745-1859.
Merz, J. J. *A History of European Thought in the Nineteenth Century.* Vols. 1 & 2. Dover.

History and Philosophy of Science III

Double session subject

The Social History of Science: An account of the growth of the scientific movement, from the early 17th to the 20th century, in relation to: (a) its social and cultural environment and the effects of social structures and social changes upon it; (b) its internal organisation; (c) its effects, intellectual and (via technology) material, upon society. The course deals with such topics as: the different national contexts of the scientific movement; its social composition at various times; its relations with the state in different countries at different times, with the universities and other teaching institutions, and with the professions of medicine and engineering; the communications system in science; the nature and functions of scientific societies and academies; the effects of science on technology and of technology on science; the institutionalization and professionalization of science. The intellectual influence of science on society, already treated in H.P.S. I and II in connection with the Copernican and Darwinian Revolutions, is further discussed in other connections. In the early part of the course there is a discussion of the influence of the ideas of Bacon and Descartes in the formation of the scientific tradition.

TEXTBOOKS

No suitable books are available. Selections from primary sources, reading lists, and other material will be issued by the Department.

MATHEMATICS

Mathematics I

Double session subject (6 hrs. per week).

Session 1: Calculus, introduction to abstract algebra, introduction to computing.

Session 2: Calculus, abstract algebra, linear algebra.

TEXTBOOKS

McCoy, N. H. *introduction to Modern Algebra.* Allyn & Bacon.

Thomas, G. B. *Calculus and Analytic Geometry.* 4th ed. Addison-Wesley.

Statistics for Economists

First session subject (4 hrs. per week).

Session 1: Introduction to statistics, FORTRAN programming.

REFERENCE BOOKS

Freund, J. E. *Modern Elementary Statistics.* Prentice-Hall.

Hamburgh, M. *Statistical Analysis for Decision Making.* Harcourt, Brace & Javanovich.

Hayes, W. *Statistics.* Holt, Rhinehart & Winston.

Hoel, P. *Elementary Statistics.* Wiley.

Huntsburger, D. & Billingsley, P. *Elements of Statistical Inference.* Allyn & Bacon.

Analysis I

Double session subject (2 hrs. per week)

Session 1: Partial differentiation, multiple integrals, differential equations of the first order and second order with constant coefficients.

Session 2: Fourier series, second order differential equations.

TEXTBOOKS

Boyce, W. E. & Di Prima, R. C. *Elementary Differential Equations and Boundary Value Problems.* Wiley.

Thomas, G. B. *Calculus and Analytic Geometry.* 4th ed. Addison-Wesley.

REFERENCE BOOKS

Britton, J. R., Kreigh, R. B. & Rutland, L. W. *University Mathematics.* Vol. 2. Freeman.

Hilton, P. J. *Partial Derivatives.* Routledge & Kegan Paul.

Kaplan, W. & Lewis, D. J. *Calculus and Linear Algebra.* Vol. 2. Wiley.

Kolman, B. & Trench, W. F. *Elementary Multivariable Calculus.* Academic Press.

Ledermann, W. *Multiple Integrals.* Routledge & Kegan Paul.

Marder, L. *Calculus of Several Variables.* Allen & Unwin.

Protter, M. H. & Morrey, C. B. *Modern Mathematical Analysis.* Addison-Wesley.

Sneddon, I. N. *Fourier Series.* Routledge & Kegan Paul.

Sokolnikoff, I. S. *Advanced Calculus.* McGraw-Hill.

Spiegel, M. R. *Advanced Calculus.* Schaum.

Algebra I

Double session subject (2 hrs. per week)

Session 1: Vector algebra, vector calculus, general integral theorems, matrix algebra, eigen-values and eigen-vectors.

Session 2: Further linear algebra, linear transformations. Vector spaces.

REFERENCE BOOKS

Ayres, F. *Matrices.* Schaum.
Davis, H. F. *Vector Analysis.* Allyn & Bacon.
Lipschutz, S. *Linear Algebra.* Schaum.
Spiegel, M. R. *Vector Analysis.* Schaum.

Theory of Functions I

Double session subject (2 hrs. per week).

Session 1: Fundamental point-set topology and set theory, uniform convergence.

Session 2: Differentiable functions. Riemann integration, Euclidian vector spaces.

TEXTBOOK

Youse, B. K. *Introduction to Real Analysis.* Allyn & Bacon.

REFERENCE BOOKS

Gaughan, E. *Introduction to Analysis.* Brooks-Cole.
Goffman, C. *Introduction to Real Analysis.* Harper International.
Lick, D. R. *The Advanced Calculus of One Variable.* Appleton-Century-Crofts.
Rosenlicht, M. *Introduction to Analysis.* Scott, Foresman & Co., 1968.
Rudin, W. *Principles of Real Analysis.* McGraw-Hill.
Sprecher, D. A. *Elements of Real Analysis.* Academic Press.

Dynamics

Double session subject (2 hrs. per week).

Session 1: Elementary dynamics of a particle and a rigid body.

Session 2: Vibrations of particles, normal modes, vibrations of continuous systems.

TEXTBOOK

Green, S. L. *Dynamics.* University Tutorial Press, London.

Probability

Double session subject (2 hrs. per week).

Session 1: Probability, discrete and continuous distributions, expectation.

Session 2: Sampling distributions, estimation, tests of hypotheses.

REFERENCE BOOKS

Barr, D. & Zehna, P. *Probability.* Brooks-Cole.
Dwass, M. *Probability Theory and Applications.* W. A. Benjamin
Lukacs, E. *Probability and Mathematical Statistics.* Academic Press.
Thomasian, A. J. *The Structure of Probability Theory with Applications.* McGraw-Hill.
Zehna, P. *Probability Distributions and Statistics.* Allyn & Bacon.

Numerical Analysis I

Double session subject (2 hrs. per week).

Session 1: Numerical processes applied to functions, equations, differential equations, integration, matrices.

Session 2: Further numerical work on integration; matrices; direct methods and least squares.

REFERENCE BOOKS

Conte, S. D. & De Boor, C. *Elementary Numerical Analysis.* McGraw-Hill.

Froberg, C. E. *Introduction to Numerical Analysis.* Addison-Wesley.

McCracken, D. D. & Dorn, W. S. *Numerical Methods and Fortran Programming.* Wiley International.

Geometry I

Double session subject (2 hrs. per week).

Session 1: Elementary algebraic projective geometry.

Session 2: Elementary differential geometry of curves and surfaces.

TEXTBOOKS

Horadam, H. F. *A Guide to Undergraduate Projective Geometry.* Pergamon.

Wilmore, T. J. *An Introduction to Differential Geometry.* Oxford U.P.

Statistics for Metallurgists

Double session subject (2 hrs. per week)

Session 1: Probability, discrete and continuous distributions, random variables and expected value.

Session 2: Sampling distributions, estimation, testing of hypotheses, regression analysis and analysis of variance.

REFERENCE BOOKS

Guenther, W. *Concepts of Statistical Inference.* McGraw-Hill.

Guttman, I., Wilks, S. & Hunter, J. *Introductory Engineering Statistics.* Wiley.

Kreyszig, E. *Introductory Mathematical Statistics.* Wiley.

Walpole, R. & Myers, R. *Probability and Statistics for Engineers and Scientists.* Macmillan.

Complex Variable

Double session subject (2 hrs. per week).

Session 1: Complex functions, analytic functions, Laurent series.

Session 2: Singularities, residues, contour integrals, conformal mapping.

TEXTBOOK

Levinson, M. & Redheffer, R. M. *Complex Variables.* Holden-Day, 1970.

REFERENCE BOOK

Spiegel, M. R. *Complex Variables.* Schaum.

Analysis II

Double session subject (2 hrs. per week).

Session 1: Laplace and Fourier Transforms, Error, Gamma, Zeta and Hypergeometric functions.

Session 2: Two-sided Laplace, Mellin and Hankel transforms, Bessel and Legendre functions. Orthogonal polynomials.

TEXTBOOKS

Keane, A. *Integral Transforms.* Science Press, Sydney.
Reichel, A. *Special Functions.* Science Press, Sydney.

REFERENCE BOOKS

Rainville, E. D. *Special Functions.* Macmillan.
Spiegel, M. R. *Laplace Transforms.* Schaum.

General Topology

Double session subject (2 hrs. per week).

Session 1: Topological spaces, separation axioms, filters, compactness, local compactness and connectedness, continuous functions.

Session 2: Metric spaces and function spaces.

TEXTBOOK

Moore, T. O. *Elementary General Topology*. Prentice-Hall.

REFERENCE BOOKS

Bourbaki, N. *Topologie Generale.*
Fairchild, W. W. & Ionescu Tulcea, C. *Topology.*
Hall, D. W. & Spencer, G. L. *Elementary Topology.*
Kasriel, R. H. *Undergraduate Topology.*
Kelley, J. L. *General Topology.*

Algebra II

Double session subject (2 hrs. per week).

Session 1: Groups, rings and ideals.

Session 2: Fields, algebraic numbers and Galois theory.

TEXTBOOK

Herstein, I. N. *Topics in Algebra.* Ginn Blaisdell.

REFERENCE BOOKS

Barnes, W. E. *Introduction to Abstract Algebra.* Heath & Co.
Herstein, I. N. *Topics in Algebra.* Ginn Blaisdell.
Lang, S. *Algebra.* Addison-Wesley.
Van der Waerden, B. L. *Modern Algebra I.* Ungar Publishing Co.

Theory of Functions II

Double session subject (2 hrs. per week).

Session 1: Metric spaces, function spaces, analytic functions and continuation, multiple valued functions.

Session 2: Lebesgue Integration.

TEXTBOOKS

Epstein, B. *Linear Functional Analysis.* Saunders.
Levinson, N. & Redheffer, R. *Complex Variables.* Holden-Day.

REFERENCE BOOKS

Ahlors, L. *Complex Analysis.* McGraw-Hill.
Burkhill, J. C. *The Lebesgue Integral.* C.U.P.
Cupson, E. T. *Metric Spaces.* C.U.P.
Graves, L. M. *Theory of Functions of Real Variables.* McGraw-Hill.
Hartman, S. and Mikusinski, J. *The Theory of Lebesgue Measure and Integration.* Pergamon, 1961.
Hobpon, E. V. *The Theory of Functions of a Real Variable.* Dover.
Nevawlinna, R. & Paatero, V. *Introduction to Complex Variable.* Addlson-Wesley.

Dynamics of Continuous Media

Double session subject (2 hrs. per week).

Session 1: Introduction to non-viscous fluid flow in two and three dimensions, compressible flow, water waves including surface and long waves. *Session 2:* Capillary and finite amplitude waves, dispersion, perturbation theory, interaction of waves, spectral analysis, infinitesimal stress and strain theory.

TEXTBOOK

Rutherford, D. E. *Fluid Dynamics.* Oliver & Boyd.

REFERENCE BOOKS

Bullen, K. E. *Introduction to Seismology.* C.U.P.
Sokolnikoff, I. S. *Mathematical Theory of Elasticity.* McGraw-Hill.

Stochastic Processes

Second session subject (4 hrs. per week).

Session 2: Probability measures, random variables, branching processes, renewal processes, Markov chains, test of significance, sequential analysis.

TEXTBOOK

Karlin, S. *A First Course in Stochastic Processes.* Academic Press.

Mathematical Methods

Double session subject (2 hrs. per week).

Session 1: Cartesian tensors, calculus of variations.

Session 2: Laplace's and Poisson's equation, optimisation of numerical process in solving differential equations, harmonic and data analysis.

TEXTBOOK

Elsgolc, L. E. *Calculus of Variations.* Pergamon.

REFERENCE BOOKS

Dettman, J. W. *Mathematical Methods in Physics and Engineering.* McGraw-Hill.
Hildebrand, F. B. *Methods of Applied Mathematics.* Prentice-Hall.
Jeffreys, H. & Jeffreys, B. *Methods of Mathematical Physics.* C.U.P.

Operations Research

First session subject (4 hrs. per week).

Session 1: Linear, non-linear and dynamic programming, queueing theory, theory of games. Simulation.

REFERENCE BOOK

Wagner, H. *Principles of Operations Research.* Prentice-Hall.

Ocean Dynamics

Double session subject (2 hrs. per week).

Session 1: Edge Waves.

Session 2: Tidal dynamics, estuary and coastline dynamics, introduction to ocean currents.

REFERENCE BOOKS

Ippen, A. T. *Estuary and coastline hydrodynamics.*
Neumann, G. *Ocean Currents.*

Numerical Analysis II

Double session subject (2 hrs. per week).

Session 1: Advanced work on function evaluation, solution of algebraic equations, solution of differential equations, and integration. Linear algebra: solutions of equations, calculations of eigen-values and eigen-vectors.

Session 2: Further linear algebra. Boundary value problems. Solution of partial differential equations.

TEXTBOOK

Froberg, C. *Introduction to Numerical Analysis.* Addison-Wesley.

REFERENCE BOOKS

Fox, L. *Numerical Solution of Ordinary and Partial Differential Equations.* Pergamon.
Householder, A. *Theory of Matrices in Numerical Analysis.* Blaisdell.
Varga, R. S. *Matrix Iterative Analysis.* Prentice-Hall.
Wilkinson, J. H. *The Algebraic Eigen-Value Problem.* Oxford U.P.

Partial Differential Equations

Double session subject (2 hrs. per week).

Session 1: Cauchy-Kowaleski theorem, first order equations, linear second order equations.

Session 2: Elliptic, parabolic and hyperbolic equations.

TEXTBOOK

Donnemeyer, R. *Introduction to partial differential equations and boundary value problems.* McGraw-Hill.

REFERENCE BOOKS

Epstein, B. *Partial Differential Equations.* McGraw-Hill.
Greenspan, D. *Introduction to Partial Differential Equations.* McGraw-Hill.
Sneddon, I. *Elements of Partial Differential Equations.* McGraw-Hill.

Logic and Number Theory

Double session subject (2 hrs. per week).

Session 1: Nonaxiomatic and axiomatic treatments of positional and predicate calculus, formal number theory based on logic.

Session 2: Primality, linear and quadratic, resldue theory.

TEXTBOOKS

Griffin, H. *Elementary Theory of Numbers.* McGraw-Hill.
Mendelson, E. *Introduction to Mathematical Logic.*

REFERENCE BOOKS

Dickson, L. E. *Introduction to the Theory of Numbers.* Dover.
Dudley, U. *Elementary Number Theory.* Freeman.
Hardy, G. & Wright, E. *The Theory of Numbers.* Oxford.
Kleene, S. C. *Mathematical Logic.*
Niven, I. & Zuckerman, S. *An Introduction to Number Theory.*
Pettofrezzo, A. J. & Byrkit, D. R. *Elements of Number Theory.* Prentice-Hall.
Shoenfield, J. R. *Mathematical Logic.* Addison-Wesley.
Uspensky, J. V. & Heaslet, M. A. *Elementary Number Theory.*
Vinogradov, I. M. *Elements of Number Theory.* Dover.

Ordinary Differential Equations

Double session subject (2 hrs. per week).

Session 1: Existence and uniqueness, solution in series, Storm-Liouville Theory, Green's functions.

Session 2: Non-linear equations, stability, Liapunov functions and methods.

TEXTBOOK

Boyce, W. E. & Di Prima, R. C. *Elementary Differential Equations and Boundary Value Problems.* 2nd ed. Wiley.

REFERENCE BOOKS

Birkhoff, G. & Rota, G. C. *Ordinary Differential Equations.* Blaisdell.
Leighton, W. *Ordinary Differential Equations.* Wadsworth.
Platt, O. *Ordinary Differential Equations.* Holden-Day.
Rabenstein, A. L. *Elementary Differential Equations with Linear Algebra.* Academic Press.

Mathematics II Metallurgy

One session subject (4 hrs. per week).

Course content and textbooks as for Analysis I.

Mathematics II Engineering

Double session subject (5 hrs. per week).

Session 1: As for Analysis I *plus*
Vector algebra, vector calculus.

Session 2: As for Analysis II *plus*
General integral theorems, matrix algebra, eigen-values and eigen-vectors.

TEXTBOOKS

Boyce, W. E. & Di Prima, R. C. *Elementary Differential Equations and Boundary Value Problems.* 2nd ed. Wiley.
Keane, A. *Integral Transforms.* Science Press, Sydney.
Reichel, A. *Special Functions.* Science Press, Sydney.
Thomas, G. B. *Calculus and Analytic Geometry.* 4th ed. Addison-Wesley.

METALLURGY

	Hours per Week Session 1	Session 2
LEVEL 1 SUBJECTS		
Physical Properties of Crystals I and II	1	1
Phase Equilibria	1	–
Optical Metallography	1	–
Structure of Alloys I	–	1
Introduction to Mechanical Metallurgy	1	–
Shaping Processes and Testing	–	1
Fluid Flow I and II	1	1
Thermodynamics I	1	–
Extraction Processes I, II and III	2	1
Metallurgy Laboratory/Tutorial	2½	4½
LEVEL 2A SUBJECTS		
Physical Properties of Crystals III	1	–
Kinetics	1	–
Structure of Alloys II	–	1
Elasticity	1	–
Structure and Mechanical Properties I	1	–
Thermodynamics II and III	1	1
Mineral Dressing I and II	1	1
Refractories	–	1
Metallurgy Laboratory/Tutorial	5	5
LEVEL 2B SUBJECTS		
Mechanisms of Phase Transformations	1	–
Structure of Alloys III	–	1
Structure and Mechanical Properties II	1	–
Metal Joining	1	–
Fracture	–	1
Heat Transfer I and II	1	1
Mass Transfer I and II	1	1
Extraction Processes IV	–	1
Seminar	1	1
Metallurgy Laboratory/Tutorial	5	5

LEVEL 2 SUBJECTS: Essentially Level 2A and level 2B Subjects combined but excluding Extraction Processes IV.

LEVEL 3 CORE SUBJECTS		
Interfaces	1	–
Structure of Alloys IV	–	1
Structure and Mechanical Properties III	1	–
Plasticity and Metal Shaping	–	1
Reaction Engineering	1	–
Refining	1	–
Extraction Process V and VI	–	2
Metallurgy Laboratory/Tutorial	5	5

	Hours per week Session 1	Session 2
LEVEL 3 OPTION UNITS (4 to be taken)		
Non-Destructive Testing	1	–
Crystallography of Phase Transformations	–	1
Advanced Mechanical Metallurgy	1	–
Solidification	–	1

Note: further option units will be offered as facilities permit.

Metallurgy Level I

TEXTBOOKS

Barrett, C. S. & Massalski, T. B. *Structure of Metals.* 3rd ed. McGraw-Hill.
Butts, A. B. *Metallurgical Problems.* McGraw-Hill.
Darken, L. S. & Gurry, R. W. *Physical Chemistry of Metals and Alloys.* McGraw-Hill.
Dennis, W. H. *Extractive Metallurgy.* Pitman.
Dieter, G. E. *Mechanical Metallurgy.* McGraw-Hill.
Foust, A. S. et al. *Principles of Unit Operations.* Wiley.
Reed-Hill, R. E. *Physical Metallurgy Principles.* Van Nostrand.
Szekely, J. & Themelis, N. J. *Rate Phenomena in Process Metallurgy.* Wiley.
Wulff, J. ed. *The Structure and Properties of Materials.* Vols. 1 & 2. Wiley.

Metallurgy Level II

TEXTBOOKS

As for Level I, together with:
Burke, I. *The Kinetics of Phase Transformations in Metals.* Pergamon.
Fine, M. E. *Phase Transformations in Condensed Systems.* Macmillan.
Hull, D. *Introduction to Dislocations.* Pergamon.
Swalin, R. A. *Thermodynamics of Solids.* Wiley.
Tegart, W. J. McG. *Elements of Mechanical Metallurgy.* Macmillan.
Udin, H., Funk, E. R. & Wulff, J. *Welding for Engineers.* Wiley.

Metallurgy Level III

TEXTBOOKS

As for Levels I and II, together with:
Lamble, J. E. ed. *Principles and Practice of Non-Destructive Testing.* Haywood & Co.
Levenspiel, O. *Chemical Reaction Engineering.* Wiley.

PHYSICS

FIRST LEVEL PHYSICS

Mechanics, Electricity and Magnetism

Double session subject (84 hrs. lectures, 28 hrs. tutorials and 56 hrs. practical).

First session

Kinematics and frames of reference; dynamics of a particle; vibrations; electrostatics; d.c. circuits.

Second session

Dynamics of a rigid body; waves, electromagnetism; a.c. circuits.

TEXTBOOK

Resnick, R. & Halliday, D. *Physics.* Combined edition. Wiley.

SECOND LEVEL PHYSICS

Electromagnetism and Optics

Double session subject (42 hrs. lectures and 42 hrs. practical).

First session

Electromagnetism

1. Vector analysis appropriate to the course.
2. Fundamentals of electromagnetism leading up to Maxwell's Equations.
3. Wave equations.
4. Radiation from an oscillating dipole.

Second session

Optics

1. Propagation of light.
2. Coherence and interference.
3. Diffraction.
4. Thermal radiation and light.

TEXTBOOKS

Bleaney, B. I. & Bleaney, B. *Electricity and Magnetism.* 2nd ed. Oxford at the Clarendon Press, 1965.

Fowles, G. R. *Introduction to Modern Optics.* Holt, Rinehart & Winston.

Atomic Physics, Nuclear Physics and Wave Mechanics

Double session subject (42 hrs. lectures and 42 hrs. practical).

First session

Atomic Physics

Black body radiation; the photoelectric effect; the Compton effect; light quanta and interference phenomena, coherence; atomic spectroscopy; Stern—Gerlach experiment; X-ray and electron diffraction.

Second session

Wave Mechanics

Matter waves; Schrodinger wave equation; free particle; correspondence principle; square potentials.

Nuclear Physics

General Properties of the Nucleus: Quantum states, binding energy; stable and unstable nuclei; fission; size of nuclei coulomb barrier; angular momentum, spin, electric and magnetic moments; statistics of nuclear constituents; nuclear stability and saturation of nuclear forces.

TEXTBOOK

Richtmyer, F. K., Kennard, E. H. & Cooper, J. N. *Introduction to Modern Physics.* 6th ed. McGraw-Hill, 1971.

Mechanics, Thermodynamics and Statistical Physics

Double session subject (42 hrs. lectures and 42 hrs. practical).

First session

Mechanics

Introductory topics: coordinate transformations, properties of rotation matrices, transformation matrices.

Fundamentals of Newtonian mechanics: Newton's Laws, frames of reference, equation of motion for a particle, conservation theorems.

Oscillatory motion: The simple harmonic oscillator, damped harmonic motion, forced oscillations, the Laplace Transform Method, oscillations in a potential well.

Thermodynamics and Statistical Physics

Characteristic features of microscopic systems: irreversibility and the approach of equilibrium; heat and temperature.

Basic probability concepts; statistical ensembles, mean values for a spin system, distribution of molecules in an ideal gas.

Statistical description of systems of particles; statistical ensembles and postulates, equilibrium and reversibility, interactions between systems—thermal and adiabatic, general interactions—first law of thermodynamics.

Thermal interactions: distribution of energy between macroscopic systems, entropy as a measure of accessible states, contact with heat reservoir—Boltzmann factor, canonical distribution applied to paramagnetism.

Second session

Mechanics

The special theory of relativity: Galilean invariance, the Lorentz transformation, momentum and energy in relativity.

Calculus of variations: Euler's equations, functions with several dependent variables, Euler equations with auxiliary conditions.

Hamilton's principle—Lagrangian and Hamiltonian dynamics: Hamilton's principle, Lagrange's Equations of Motion, Euler's Theorem applied to kinetic energy, conservation theorems, canonical equations of motion—Hamiltonian dynamics, the Virial Theorem. The Lagrangian Function in special relativity.

Thermodynamics and Statistical Physics

Microscopic theory and macroscopic measurements: work, internal energy and heat, heat capacity and entropy changes.

Canonical distribution in the classical approximation: Maxwell velocity distribution, the equipartition theorem, specific heat of a monatomic ideal gas.

General thermodynamic interactions: the thermodynamic identity, entropy —adiabatic compression, the laws of thermodynamics, the Gibbs free energy and equilibrium, equilibrium between phases.

TEXTBOOKS

Stephenson, R. J. *Mechanics and Properties of Matter.* 3rd ed. Wiley International Edition, 1969.
Zemansky, M. W. *Heat and Thermodynamics.* McGraw-Hill, 1968.

Astronomy

Double session subject (54 hrs. lectures and 30 hrs. practical)

First session

Aspects of the sky; the earth in motion; timekeeping, light and the telescope; the moon; eclipses of the moon and sun; the solar system; planets and their satellites; the sun.

Second session

The stars; stellar atmosphere and interiors; intrinsic variable stars; binary stars; star clusters; interstellar gas and dust; the galaxy; the exterior galaxies.

TEXTBOOKS

Tayler, R. J. *The Stars: their structure and evolution.* Wykeham Publications, London, 1970.
Wyatt, S. P. *Principles of Astronomy.* 2nd ed. Allyn & Bacon, Boston, 1971.

Supplemented by notes and references to be given by lecturers.

THIRD LEVEL PHYSICS

Classical Mechanics and Quantum Mechanics

Double session subject (56 hrs. lectures and 28 hrs. seminars).

First session

Classical Mechanics

Non-linear oscillations phase diagrams for non-linear systems; non-linear oscillations in an asymmetric potential; central-force motion; kinematics of two-particle collisions; elastic collisions; cross sections; the Rutherford scattering formula; motion in a noninertial reference frame.

Quantum Mechanics

Introduction: postulates of quantum mechanics, operators of quantum mechanics, state function space—vector space, eigenvalue equations—basic vectors, expectation values, Orthonormal sets—sharing of eigenfunction sets.

The Hamiltonian Operator and Schrodinger's Equation: Hamiltonian eigenfunctions as basis wave functions; time variation of expectation values. Uncertainty principle.

Momentum representation: Fourier transforms general applications.

The harmonic oscillator—Schrodinger treatment.

The matrix formulations of quantum mechanics: matrix treatment of harmonic oscillator, promotion demotion operators.

Second session

Classical Mechanics

Dynamics of rigid bodies: the inertia tensor, moments of inertia for different body coordinate systems, Euler's equations for a rigid body, motion of a symmetrical top with one point fixed, the stability of rigid-body solutions.

Coupled oscillations.

Waves in strings.

Quantum Mechanics

The hydrogen atom: relativistic and spin effects in the hydrogen atom. Angular momentum: pure matrix treatment of angular momentum. Time-independent perturbation theory: non-degenerate systems; Zeeman effect in hydrogen.

Collision Theory: time-dependent perturbation theory.

Multiparticle systems.

TEXTBOOKS

Marion, J. B. *Classical Dynamics of Particles and Systems.* Student edition. Academic Press, 1965. Paperback.

White, R. L. *Basic Quantum Mechanics.* McGraw-Hill, N.Y., 1966.

Astrophysics

Double session subject (45 hrs. lectures and tutorials).

First session

Observational basis; Hertsprung-Russell diagrams; galactic and globular clusters; stellar populations; radiative transfer; atomic ionization; equation of transfer in local thermodynamic equilibrium; opacity; theory of spectral line formation.

Second session

Line contour theory curves of growth; equations for stellar interiors; energy transport; nuclear reactions in stars; construction of stellar models; main sequence structures; stellar evolution.

TEXTBOOK

Motz, L. *Astrophysics and Stellar Structure.* Ginn & Co., 1970.

REFERENCE BOOKS

Aller, L. H. *Astrophysics: The Atmospheres of the Sun and Stars.* 2nd ed. The Ronald Press, 1970.

Menzel, D. H., Bhatnager, P. L. & Sen, H. K. *Stellar-Interiors.* Chapman & Hall, 1963.

Tayler, R. J. *The Stars: their Structure and Evolution.* Wykeham Publications, London, 1970.

Solid State Physics and Nuclear Physics

Double session subject

Solid State Physics

First and second session

Crystalline state: the classification of crystals; crystal lattices; diffraction of X-rays, electrons and neutrons; reciprocal lattices; structure determination. Crystal binding: covalent, ionic, metallic.

Lattice vibrations: phonons, phonon scattering, lattice heat capacity. Electron-theory of metals; Fermi-Dirac distribution, heat capacity of electron gas, thermal conductivity, energy bands, Fermi surfaces. Semi conductors: intrinsic, impurity states, p-n junction.

TEXTBOOK

Kittel, C. *Introduction to Solid State Physics.* 4th ed. John Wiley & Sons Inc., N.Y., 1967

Nuclear Physics

First and second session

Forces between nucleons: n-p and p-p, deuteron ground state, nuclear stability.

Nuclear spectroscopy: systematics of stable nuclei, models of the nucleus.

Nuclear reactions: description, cross sections, compound nucleus, resonance theory.

High energy interactions and elementary particles.

TEXTBOOK

Arya, A. P. *Fundamentals of Nuclear Physics.* Allyn & Bacon, 1966.

Statistical Mechanics and Kinetic Theory

Double session subject (45 hrs. lectures and tutorials).

Statistical Mechanics

First session

The canonical distribution; connection of statistics with thermodynamics: the Fermi and Bose oscillators; statistics of simple systems; the ideal insulating crystal; black body radiation; systems of identical particles; the Ideal Gas; the grand canonical distribution; non-interacting identical particles; Bose-Einstein and Fermi-Dirac distributions; the ideal monatomic gas at a definite chemical potential; Bose-Einstein degeneration; conduction of electrons in metals.

Kinetic Theory

Second session

Collisions; Boltzmann Transport Equation; equilibrium properties of a gas; hydrodynamic equations; interaction between gases in equilibrium; expansion of the distribution function; transport properties of a simple gas; transport properties of a gas mixture: some approximate forms for the collision term in the Boltzmann Transport Equation.

TEXTBOOK

Kittel, C. *Thermal Physics.* John Wiley, 1969.

Laboratory Project and Thesis

(90 hrs.).

PSYCHOLOGY

First Year

1. All students enrolling for the first year of Psychology are required to take Psychobiology, Psychological Measurement I, Laboratory Method and Motivation, Development and Adjustment.

Second Year

2. Provision is made for students proceeding into Psychology II as part of a BA, a BCom (Applied Psychology) or a BSc (Applied Psychology) degree. Arts students are provided for at both Pass and Honours levels. The individual units contained in these courses are as follows:

3. *Second Year Pass Course*

   Personality Theory
   Learning Theory
   Developmental Psychology
   Laboratory Method II

4. *Second Year BCom (Applied Psychology)*

   Personality Theory
   Learning Theory
   Laboratory Method II
   Psychological Testing
   Research Design
   Psychological Measurement II

5. *Second Year Honours Course and BSc (Applied Psychology)*

   Personality Theory
   Learning Theory
   Personality Laboratory
   Learning Laboratory
   Psychological Measurement II
   Research Design
   Psychological Testing
   Developmental Psychology

Third Year

6. Provision is made for students proceeding into Psychology III as part of a BA, BCom (Applied Psychology) or a BSc. Intending part-time students are advised that attendance at seminars and lectures during the hours 9 a.m. to 5 p.m. may exceed 6 hours per week.

7. *Third Year Pass Course (Arts and Commerce)*

   Psychology IIIA—Unit 1
   Psychological Theory
   Social Psychology
   Educational Psychology

   Psychology IIIA—Unit 2

   Advanced Psychological Theory
   Counselling Psychology
   Experimental Psychology

8. *Third Year Distinction Course (Arts)* and *Pass and Distinction (Science), Psychology IIIA, Units 1 and 2, together with:*

Psychology IIIB—Unit 1

Advanced Social Psychology
Advanced Educational Psychology

Psychology IIIB—Unit 2

Advanced Counselling Psychology
Advanced Experimental Psychology

Note: *Psychology IIIA—Unit 1* is a co-requisite for *Psychology IIIB—Unit 1.*

Psychology IIIA—Unit 2 is a co-requisite for *Psychology IIIB—Unit 2.*

Psychology IIIA—Unit 1 is a pre-requisite for *Psychology IIIA—Unit 2.*

Psychology IIIB—Unit 1 is a pre-requisite for *Psychology IIIB—Unit 2.*

Fourth Year (Honours)

11. The Honours year in Psychology is planned to both prepare the student for professional practice and to pave the way for further academic work. Students are required to attend three seminar courses of full-year duration, these are: Significant Developments in Psychology; Applications and Current Issues in Psychology; and Research (The major requirements are two individual research theses, based on theoretical and empirical work by the student). Intending Honours students should consult with the Head of the Department.

DEPARTMENT OF PSYCHOLOGY

COURSES OFFERED — 1974

Title	Session	Class Hours Per Week
PSYCHOLOGY I		
Psychobiology	2	3
Psychological Measurement 1	1	3
Laboratory Method	2	3
Motivation, Development and Adjustment	1	3
PSYCHOLOGY II		
Personality Theory	1	2
Psychological Testing	2	2
Developmental Psychology	2	2
Laboratory Method II	Year	2
Personality Laboratory Course	1	3
Learning Laboratory Course	2	3
Learning Theory	2	2
Psychological Measurement 2	1	2
Research Design	1	2
PSYCHOLOGY IIIAi		
Psychological Theory	1	2
Social Psychology	1	2
Educational Psychology	1	2
PSYCHOLOGY IIIAii		
Advanced Psychological Theory	2	2
Experimental Psychology	2	2
Counselling Psychology	2	2
PSYCHOLOGY IIIBi		
Advanced Social Psychology	1	3
Advanced Educational Psychology	1	3
PSYCHOLOGY IIIBii		
Advanced Experimental Psychology	2	3
Advanced Counselling Psychology	2	3
PSYCHOLOGY IV		
Significant Developments in Psychology	Year	1½
Applications and Current Issues in Psychology	Year	1
Research Seminar	Year	1½

PSYCHOLOGY I

Psychobiology

Second session subject

Aims of the Course:

1. This is an introductory course in biological and physiological aspects of behaviour. Students are required to read widely. The principal aim is to stimulate interest in the behavioural sciences.

2. The course deals with areas of psychology which have a relatively long history and an established body of empirical data. Thus, students will be introduced to experimental method and typical data at an early stage in their course work.

Syllabus:

The history of psychology as a science, the multiple strategies of psychology, aspects of applied psychology, and current research will be discussed. Some social issues such a mental disorders, suicidal behaviour, drug use and abuse, and the environment will be discussed briefly.

1. *Physiological and neurological background.* The following will be described and discussed: the central nervous system; basic units of the nervous system; hierarchical organization of the human brain; neurones and synapses; conduction of the nerve impulse; the all-or-none law; the autonomic nervous system; reflexes; endocrines and hormones; psychopharmacology. Sleep. The effects of drugs on behaviour.

2. *Sensory processes and perception.* The general nature of sensory stimulation. Types of receptors and sensory mechanisms. Transduction. Vision. Audition. Chemical senses. Skin senses. Kinesthesis. Vestibular senses. Object perception and perceptual constancies. Set and attention. Space and depth perceptions. The perception of movement and time. Perception and learning. Environmental psychology.

3. *Learning.* Definitions. Infrahuman learning. Human learning. Classical conditioning. Respondent and operant conditioning. Observational learning. Punishment. Imprinting. Learning theory. Biochemical bases of learning. Acquisition of skills.

Although detailed study will be required (specific sections of texts will be recommended in lectures) it will generally be sufficient to have read the relevant sections of the syllabus in most modern introductory texts. Students are advised to obtain ONE of the following:

TEXTBOOKS

either

Dember, W. N. & Jenkins, J. J. *General Psychology. Modeling Behavior and Experience.* Prentice-Hall, N.J., 1970.

(Students purchasing this text may also wish to consider the *Workbook for General Psychology* by Kammann, R., produced by the same publisher, 1970).

or

Gilmer, B. von Haller. *Psychology.* Harper & Row International edition, N.Y., 1970.

A three-hours written examination will be given on the above syllabus, the value of which will be 60% of the course marks. In addition to one of the recommended texts students should be prepared to purchase the following supplementary texts, as four objective tests based on these books, will be set during the session. The four tests will be valued at 40% of the course marks.

Disch, R. ed. *The Ecological Conscience. Values for Survival.* Prentice-Hall, N.J., 1970. (Spectrum paperback).
Girdano, D. A. & Girdano, D. D. *Drug Education: Content and Methods.* Addison-Wesley, Mass., 1972.
Oswald, I. *Sleep.* Penguin, Middx., 1970.
Thompson, R. F. *Introduction to Biopsychology.* Albion, San Francisco, 1973.
Whittaker, J. O. ed. *Recent Discoveries in Psychology. Readings for the Introductory Course.* Saunders, Pa., 1972.

Psychological Measurement I

First session subject

Aims of the Course:

1. To equip students with a knowledge and understanding of the basic statistical concepts and techniques most appropriate to psychological measurement.
2. To enable students to apply these techniques to research data.

Syllabus:

1. Presentation of Data—Tabulation; graphical representation.
2. Measures of central tendency, with emphasis on the mean, using ungrouped and grouped data.
3. Measures of dispersion, with emphasis on the standard deviation, using ungrouped and grouped data.
4. Distributions: the normal distribution, sampling distributions. Standard scores.
5. Z. and t tests of significance.
6. Tests of hypotheses. Type I and type II errors; one tailed and two tailed tests.
7. Chi square tests.
8. Spearman Rank order correlation.
9. Variance ratio and analysis of variance.

TEXTBOOKS

Runyon, R. P. & Haber, A. *Fundamentals of Behavioral Statistics.* 2nd ed. Addison-Wesley, Mass., 1971.
Runyon, R. P. & Haber, A. *Student workbook to accompany fundamentals of behavioral statistics.* 2nd ed. Addison-Wesley, Mass., 1971.

No textbooks should be purchased until advised by the lecturer taking this course.

Laboratory Method

Second session subject

Aims of the Course:

1. To provide an introduction to research methods and the empirical research background of psychology.
2. To give students the opportunity to apply psychological measurement and statistics in research situations.

Syllabus:

Research exercises, each requiring a formal report by students, will be conducted in the following areas:

1. Arousal and measurement of human motivation.
2. Human responses in conflict situations.
3. Attitudes and group dynamics.
4. Adjustment and human reactions to stress.
5. Human learning under various controlled conditions.
6. Creativity—its measurement and enhancement.
7. Community attitudes to significant current issues.

TEXTBOOK

Kintz, B. L. & Bruning, J. L. *Readings for the introductory course.* Scott Foresman, Glenview, 1970.

Motivation, Development and Adjustment

First session subject

Aims of the Course:

1. To introduce students to Psychology as the scientific study of behaviour, and outline the areas of study which it encompasses.
2. To provide an introduction to the concept of behaviour as a product of the interaction between the individual's internal psychological environment and his external physical and social environment.
3. To examine the development through motivational and environmental processes of the basic functions of the human being.

Syllabus:

Motivation; primary and secondary, conscious and unconscious; emotions and their relationship to motivation; systematic views of human motivation; motivation and the self; the concepts of frustration; conflict and defence.

The meaning of adjustment, the development of maladjustment.

Socialisation in relation to attitudes, values, beliefs and interests. Motives, attitudes and interpersonal relations.

Individual differences and the nature-nurture or heredity-environment problem. The development of the organism biologically and physically. The development of thought processes; perceptual ability; language ability; motivational and emotional patterns; overt behaviour patterns.

TEXTBOOKS

Lavatelli, C. S. & Stendler, F. *Readings in Child Behaviour and Development.* 3rd ed. Harcourt, Brace & Jovanovich, 1972.

Other texts may be required and students will be notified at the beginning of the year.

PSYCHOLOGY II

Personality Theory

First session subject

Aims of the Course:

1. To examine critically the major theoretical approaches to personality structure, function and development.
2. To enhance students' critical and diagnostic skills by increasing their understanding of personality as viewed within the major orientations.
3. To provide a specialist foundation in personality development and functioning for third year electives.

Syllabus:

After considering personality and its development from a descriptive, relatively atheoretical point of view, the major attributes of and criteria for assessing a satisfactory theory of personality will be examined. Detailed critical analysis will then be made of the following theorists' views as exemplars of particular orientations: Freud (psychodynamic/psychoanalytic); Rogers (phenomenological/self); Kelly (cognitive); Cattell (trait/factor analytic); Murray (personology/motivational); Skinner, Dollard and Miller (behavioural/learning). Additionally, some familiarity with other widely recognised personality theorists will be established.

TEXTBOOK

Pervin, L. A. *Personality: Theory, Assessment and Research.* Wiley, 1970.
or
Hall, C. S. & Lindzey, G. *Theories of Personality.* Wiley, 1970.

Learning Theory

Second session subject

Aim of the Course:

1. To treat in detail material related to learning which was introduced in first year.
2. To teach laboratory methods specifically related to learning and operant conditioning.

Syllabus:

A. Theory

Definitions and historical perspective. Grant's categorization of conditioning experiments. Theories of learning. Reinforcement: basic principles. Reinforcement: theoretical issues. Classical conditioning. Respondent and operant conditioning. Generalization. Discrimination. Extinction. Learning of skills. Vibrotactile learning. Bisensory learning.

B. Laboratory

TEXTBOOK

Razran, G. *Mind in Evolution. An East-West Synthesis of Learned Behavior and Cognition.* Houghton Mifflin, Boston, 1971.

Laboratory Method II

Double session subject

Aims of the Course:

1. To give students further experience in planning, conducting and interpreting the results of empirical research in the fields of personality and of learning.
2. To illustrate with practical exercises some of the theoretical concepts or methodological problems discussed in the personality and learning theory courses.

Syllabus:

In general, three of four studies will be designed and executed as class exercises, followed by a piece of research entirely planned by students, working in groups of three to five. In each session this student planned research must be related to the theory course (personality in session 1, learning in session 2) and the report on it submitted by students will receive a greater proportion of the session's marks than will the reports on each of the class exercises.

Personality Laboratory

First session subject

Aims of the Course:

As for Laboratory Method II.

Syllabus:

As for Laboratory Method II, with respect to the Personality segment, and with the two additional requirements:

(a) The student research project must be planned, executed and reported upon by each student working alone, rather than in a group as for pass students.

(b) The laboratory report on each class exercise will have additional sections, requiring additional work as specified by the course tutor.

Learning Laboratory

Second session subject

Aims of the Course:

As for Laboratory Method II.

Syllabus:

Three laboratory exercises will be completed during the session. The first will examine retroactive interference in learning; the second exercise is titled "verbal learning"; and the third will be concerned with the influence of acoustic similarity on short-term memory.

A fourth exercise, to be completed as a personal project, is to be submitted at the end of the session by each student, i.e. before the commencement of examinations.

Psychological Measurement II

First session subject

Aims of the Course:

1. To equip students with a more advanced knowledge of techniques and concepts treated in Psychological Measurement I.
2. To illustrate the use of these techniques in the design and analysis of experiments.

Syllabus:

1. Probability theory.
2. Random sampling.
3. Sampling distributions.
4. Normal and binomial distributions.
5. Variance ratio (F).
6. Analysis of variance (one-way, two-way and three-way).
7. Correlation and regression analysis.
8. Correlation involving dichotomous data.
9. General outline of factor analysis.

TEXTBOOK

Glass, Jean V. & Stanley, J. C. *Statistical Methods in Education and Psychology.* Prentice Hall, Englewood Cliffs, N.J., 1970.

Research Design

First session subject

Aims of the Course:

1. To teach principles of research design and methodology.
2. To illustrate the practical application of statistical techniques covered in the courses Psychological Measurement I and Psychological Measurement II.

Syllabus:

1. The context of discovery.
   - Formulation of hypotheses
   - Form of hypotheses
   - Specification of meaning of terms
     - Explication
     - Definitions
   - Substruction (Facet analyses)
   - Measurement of variables
     - Scaling
     - Validity
     - Reliability

2. The context of evaluation.
   - Experimental design
     - Antecedent probability
     - Control groups
     - Variables
     - Choosing statistical methods
     - The risk function and decision theory

3. Analysis and interpretation of outcomes.
   - Causality.
   - Application of results (truth and knowledge)

4. Theories and models.
   - Elements of a formal theory
   - Formal theories and behavioural science.

TEXTBOOK

Keats, J. A. *An Introduction to Quantitative Psychology.* Wiley, Sydney, 1971.

Psychological Testing

Honours students only

Second session subject

Aims of the Course:

1. To enable students to interpret the information necessary to use and evaluate tests.
2. To familiarise students with a variety of testing and assessment procedures used in research and applied settings.
3. To place such testing methods and problems in the context of measurement in psychology as a whole.

Syllabus:

1. Test Theory.
   Scales, norms and scores.
   Standardisation.
   Reliability.
   Validity.
   Item analysis.
2. Testing and assessment procedures for:
   Personality.
   Ability.
   Achievement.
   Motivation
3. General assessment issues.

TEXTBOOK

Cronbach, L. J. *Essentials of Psychological Testing.* 3rd ed. Harper & Row, 1970.

Developmental Psychology

Second session subject

Aims of the Course:

1. To enable students to contrast varying theoretical approaches in developmental psychology by detailed exploration of specific issues.
2. To evaluate empirical studies of development changes in cognition and personality.
3. To view development as a continuing process throughout the life-span of the individual.

Syllabus:

1. Cognitive theories and research.
2. Linguistic development.
3. Personality development.
4. Changes in social interaction.

TEXTBOOK

Developmental Psychology Today. CRM Books, Del Mar, Calif., 1971.

PSYCHOLOGY III

Psychological Theory IIIA(i)

First session subject

Aims of the Course:

1. To provide a philosophical basis for work in the elective subjects in the third year which are "applied" in orientation.
2. To extend on the student's knowledge of scientific theory construction and to provide background material. This material is mainly of historical interest, but it is necessary to a thorough understanding of contemporary psychology.

Syllabus:

Psychology as a Science.

The nature of science.
Psychology's place in science.
Systems and theories.

Systems of Psychology.

Associationism, structuralism, functionalism, behaviourism, Gestalt psychology, psychoanalysis.

TEXTBOOK

Marx, M. H. & Hillix, W. A. *Systems and Theories in Psychology*. McGraw-Hill, N.Y., 1973.

Advanced Psychological Theory IIIA(ii)

Second session subject

Aims of the Course:

1. To present some theoretical developments in contemporary psychology.
2. To show the relationship of contemporary theories to older systems.

Syllabus:

Contemporary Theories.

S-R theory.
Field theory.
Varieties of personality theory.
Engineering and mathematical influences on psychology.

TEXTBOOK

Marx, M. H. & Hillix, W. A. *Systems and Theories in Psychology*. McGraw-Hill, N.Y., 1973.

Counselling Psychology IIIA(ii)

Second session subject

Aims of the Course:

1. To illustrate the practical application of major personality theories to the counselling process.
2. To introduce techniques for establishing an effective counselling relationship and general procedures for interviewing.

Syllabus:

Counselling theory.
Interview techniques.
Social aspects of counselling.
Psychological testing in counselling.

TEXTBOOK

Tyler, L. E. *The Work of the Counsellor*. 3rd ed. Appleton-Century-Crofts, N.Y., 1969.

Advanced Counselling Psychology IIIB(ii)

Aims of the Course:

1. To extend on the course in Counselling Psychology to include:
   (a) Occupational psychology and vocational guidance.
   (b) Research methods appropriate to counselling.
2. To bring the student into contact with practising counsellers in the fields of:
   (a) Education.
   (b) Psychiatry.
   (c) Vocational guidance.
3. To conduct an independent investigation related to counselling psychology.

Syllabus:

Research methods.
Occupational psychology.
Visits and visiting speakers.
Independent research project.

TEXTBOOK

Borow, H. *Man in a World at Work.* Houghton Mifflin, Boston, 1964.
or
Zytowski, D. *Vocational Behaviour.* Holt, Rinehart & Winston, N.Y., 1968.

Social Psychology IIIA(i)

First session subject

Aims of the Course:

1. To consider in detail the interaction between the personality and the social environment.
2. To present the major theories in social psychology.
3. To familiarize students with research methods appropriate to the field.

Syllabus:

1. Social psychological orientations and theories:
   (a) Field theoretical.
   (b) Psychoanalytic.
   (c) Reinforcement.
   (d) Cognitive.
2. Social psychology applied to current personal/social issues, such as:
   Conformity and independence.
   Identity problems in today's society.
   Drug use and "deviant subculture" backgrounds.
   The psychology of the disadvantaged.
   Prejudice and group relations.
3. As necessary, specific theoretical and research material will be introduced in discussing topics.

TEXTBOOKS

Shaw, M. E. & Costanzo, P. R. *Theories of Social Psychology.* McGraw-Hill, N.Y., 1970.
Students will be notified of an additional text at the beginning of 1974.

Advanced Social Psychology IIIB(i)

The same areas will be dealt with as in IIIA(i), but at greater theoretical depth and with a wider range of empirical and historical reading required. In addition, students enrolled in the IIIB(i) course will be required to plan, execute and report upon a piece of empirical research into some significant aspect of social psychology.

TEXTBOOKS

Insko, C. A. & Schopler, J. *Experimental Social Psychology*. Academic Press, 1972.
and either:
Hollander, E. P. & Hund, R. G. *Classic Contributions to Social Psychology*. Oxford U.P., 1972.
or
Fernandez, R. *Social Psychology through Literature*. Wiley, 1972.

Educational Psychology IIIA(i)

First session subject

Aims of the Course:

To study the relevance of psychology to education.

1. An evaluation of the possible relevance of areas of research in psychology to education, including:
   - — learning.
   - — cognitive processes.
   - — individual differences.
   - — social psychology.
   - — motivation.

2. Current issues in educational psychology, including:
   - — relevance of Piaget.
   - — heredity versus environment.
   - — racial differences in intelligence.
   - — expectancy effects.
   - — individual differences in learning.

TEXTBOOK

Lefrancois, G. R. *Psychology for Teaching*. Wadsworth, California, 1972.

Advanced Educational Psychology IIIB(i)

A more detailed exploration of those issues of interest to the class and of particular importance from the above syllabus will form the basis of this advanced course.

TEXTBOOK

Ripple, R. E. ed. *Readings in Learning and Human Abilities*. Harper & Row, N.Y., 1971.

Experimental Psychology IIIA(ii)

Second session subject

Aims of the Course:

1. To develop skill in conducting psychological research in the laboratory.

Syllabus:

Emphasis will be placed on experimentation in perception, learning (including vibrotactile and bisensory presentation of coded signals), signal detection and vigilance situations, and man-machine systems. The course will comprise formal theory lectures plus seminars and laboratory experimentation.

Advanced Experimental Psychology IIIB(ii)

The syllabus will be the same as that for Experimental Psychology IIIA(ii) but students undertaking this course will be expected to devote more time to laboratory experimentation and to complete two experimental studies of their own design.

The books necessary for both courses (IIIA(ii) and IIIB(ii)) will be:

TEXTBOOKS

D'Amato, M. R. *Experimental Psychology, Methodology, Psychophysics and Learning.* McGraw-Hill, N.Y., 1970.

Additional references will be given in class.

Psychology IV (Honours)

The Course has three parts comprising:

Research Seminar

Students are required to conduct two supervised research projects: an empirical exercise which is to be presented as a 15,000 words thesis, and an essay of 8,000 words about a theoretical issue in psychology. Students will be expected to give regular progress reports about their projects during the weekly seminars.

Significant Developments in Psychology Seminar

A series of seminars about important theoretical and empirical developments that are occurring in psychology.

Applications and Current Issues in Psychology Seminar

A series of seminars about ethical issues and professional applications of psychology in such areas as counselling, personnel selection, education, organisational and industrial psychology.

Postgraduate Study

POSTGRADUATE STUDY

Postgraduate study and research leading to the degrees of Master of Arts (Honours), Master of Commerce, Master of Engineering, Master of Science and Doctor of Philosophy may be undertaken.

Masters degrees, involving formal course-work, are offered in English and History (Master of Arts (Pass)), in Electrical Engineering and in Mechanical Engineering (Master of Engineering Science), and in Mathematics (Master of Science (Operations Research)).

In addition, a postgraduate diploma course in Education is offered.

Details of conditions of award and of formal course-work requirements are set out later in this section of the Handbook.

Particulars of postgraduate scholarships are given on page 225.

POSTGRADUATE ENROLMENT PROCEDURE

Research Degrees

Details of the procedure to be followed in enrolling for a research degree are given in the statement of the conditions of award of the degree as set out in the following pages.

Application forms for registration are obtainable from the Student Enquiries Section.

Before lodging an application applicants are advised to contact the head of the Department concerned, to discuss research interests, suitability of qualifications held, and the availability of facilities for research in particular areas.

Courses Requiring Attendance at Formal Lectures

Students wishing to enrol as candidates for postgraduate degrees or diplomas requiring attendance at formal lectures should make application on the appropriate form available from the College Secretary.

No enrolments will be accepted after 30th March without the express approval of the College Secretary, which will be given in exceptional circumstances only.

Students who have completed the final examinations, but have a thesis or project still outstanding, are required to enrol for the period necessary to complete the thesis or project, and to pay any requisite fees.

Re-enrolment

Enrolment forms will be sent to re-enrolling students at the beginning of the year with instructions concerning re-enrolment procedure

SOME CURRENT RESEARCH INTERESTS

Persons interested in pursuing postgraduate studies should contact the appropriate Head of Department. The research interests of the staff cover a wide range of topics, and some current fields of interest are listed:

Accountancy

Accounting theory and income concepts.
Behavioural aspects of management information systems.
Business finance.
Business objectives.
Capital expenditure decision-making.
Corporate strategy and growth through takeovers and mergers.
History and development of accounting thought.
International accounting.
Statements on accounting standards by professional bodies, and other means of improving accounting practice.

Chemistry

Chemistry of natural products—alkaloids and hallucinogenic fungi.
Correlation of chemical structure with physiological activity.
Synthetic organic chemistry.
Physical-organic chemistry — kinetic studies of hydrolysis reactions and measurement of thermodynamic acidity constants.
Catalytic deuterium exchange reactions.
Applied quantum mechanics—approximate molecular orbital theory and theories of bonding and electronic spectra.
Magneto-chemical and spectral studies of transition metal complexes.
Chemistry of organic sulphur compounds.
Gas chromatography and mass spectrometry of diastereo-isomers and metabolites.
Peptide chemistry.
Environmental chemistry.

Civil, Mechanical and Mining Engineering

Applied mechanics and photoelasticity.
Computer analysis of structures.
Development of composites.
Experimental stress analysis.
Highways and traffic.
Hydraulic model studies.
Interaction between reinforcing and parent materials.
Investigation of the potentialities of blast furnace slag.
Local effects on design wind loads.
Model analysis of structures.
Significance of tyre-pavement interaction on safety.
Study of natural soil slopes and their stability.

Finite-element method in soil mechanics.
Analysis for stresses in an anisotropic soil.
Determination of flow properties of bulk solids.
Dynamic analysis and optimization of bulk handling systems.
Flow of granular materials.
Random signal analysis and stochastic processes.
System identification studies.
Boiling heat transfer.
Exhaust emissions from internal combustion engines.
Losses across valves of reciprocating air compressors.
Propagation of waves in small bore tubes.
Treatment and disposal of industrial effluents.

Economics

Industrial economics.
Regional studies.
Economic development.
Labour economics.
Natural resource economics.

Education

Classificatory ability in Australian children.
Enrichment programmes for disadvantaged preschoolers.
Schooling and social class.
Convergent, divergent and operational thinking among white and Aboriginal children.

Electrical Engineering

Automatic control.
Plant identification.
Electrostatic precipitation.
Static converters.
Electrical machines.

English

Sixteenth to twentieth century literature.
Satire.
Old and Middle English language and literature.
Aspects of eighteenth century usage.
Nineteenth to twentieth century Australian fiction.
Some investigation of migrant English in the Illawarra region.

Geography

Soil studies.
Geography of transport systems.
Agricultural geography.
Geomorphology.

Geology

The geology of the regional coal measures.
Rock magnetism and related geophysical phenomena.
Textures of igneous and metamorphic rocks.
Invertebrates of the Lower and Middle Palaeozoic of Australasia.

History

European history during the period 1660-1800.
Eighteenth, nineteenth and twentieth century British history.
Any area of Australian history.
Any aspect of modern colonial history.

Mathematics

Functional analysis.
Logic and set theory.
Numerical analysis.
Nuclear reactor theory.
Oceanography.
Operations research.
Statistical decision theory.

Metallurgy

Deformation and fracture at elevated temperatures.
Solidification of metals.
Studies of structure changes in alloys using optical, electron-optical and X-ray methods.
Studies of flow phenomena in packed beds.
Mechanical behaviour of metals with particular reference to sheet forming operations.

Physics

Astronomy—visible and infra-red—near infra-red detectors.
Mossbauer spectroscopy.

Psychology

Accidents in industry—psychological and physical factors.
Achievement motivation.
Attitudes.
Bisensory learning including vibrotactile learning.
Decision and risk taking.
Deviant and criminal behaviour.
Disadvantaged children.
Human learning.
Personnel—selection and placement.
Prediction of academic success.
Social psychology of industry.
Student guidance and counselling services.
Time perception.

FEES

NOTE: The Australian Government has announced that course fees for students undertaking studies in tertiary educational institutions are to be abolished in 1974.

A. Students will not be required to meet fees and charges in the following categories:

1. Tuition fees and associated fees such as library fees.
2. Enrolment application, registration, matriculation and admission fees, including fees charged by central admission services.
3. Examination, deferred examination or graduation fees.
4. Fares and travel costs incurred in attending compulsory excursions, field work, etc., but excluding those listed under B below.
5. Fees paid to hospitals by medical and dental students other than those falling within the categories listed under B below.

B. Students will continue to meet the following charges:

1. Penalty charges such as late fees, parking fines, etc.
2. Administrative charges such as "statement of record" fees, "review of result" fees or charges for examinations requiring special arrangements.
3. Cost of travel incurred by students attending practical work for courses in social work, teacher training, etc.
4. Cost of travel incurred by external students attending residential schools.
5. Accommodation charges and cost of subsistence on excursions, field work, etc., and for hospital residence.
6. Charges for special clothing or laundry costs.
7. Hiring charges for use of instruments or equipment.
8. Purchase of instruments or equipment.
9. Cost of handbooks and notes.
10. Charges for matriculation and other public examinations.
11. Fees and charges associated with the development and operation of unions, student associations, students' representative councils and other student activities.
12. Deposits and refundable fees.

Completion of Enrolment

Students enrolling in post-graduate courses which include formal instruction are required to attend the College during the prescribed enrolment period† for authorisation of course programme.

Compulsory fees should be paid during the prescribed enrolment period but will be accepted without incurring a late fee during the first two weeks of Session 1. (For late fees see below.) No student is regarded as having completed an enrolment until fees have been paid. *Fees will not be accepted (i.e. enrolment cannot be completed) after 30th March* except with the express approval of the College Secretary, which will be given in exceptional circumstances only.

Assisted Students

Scholarship Holders or Sponsored Students who have not received an enrolment voucher or appropriate letter of authority from their sponsor at the time when they are enrolling should complete their enrolment paying their own fees. A refund of fees paid will be made when the enrolment voucher or letter of authority is subsequently lodged with the Cashier.

Extension of Time

Any student who is unable to pay fees by the date due may apply in writing to the College Secretary for an extension of time. Such application must give year of study, whether full-time or part-time and the course in which the applicant wishes to enrol, state clearly and fully the reasons why payment cannot be made and the extension sought, and must be lodged before the date on which a late fee becomes payable. Normally the maximum extension of time for the payment of fees is until 30th March.

Failure to Pay Fees

Any student who is indebted to the University and who fails to make a satisfactory settlement of his indebtedness upon receipt of due notice ceases to be entitled to membership and privileges of the University. Such a student is not permitted to register for a further session, to attend classes or examinations, or to be granted any official credentials.

No student is eligible to attend the annual examinations in any subject where any portion of his fees for the year is outstanding after the end of the fourth week of Session 2.

In very special cases the College Secretary may grant exemption from the disqualification referred to in the two proceding paragraphs upon receipt of a written statement setting out all relevant circumstances.

† The enrolment periods for new students are advertised in the local press during the first week of February.

COMPULSORY FEES

Postgraduate students are required to pay:

College Union*—entrance fee $22, annual fee $37.

Sports Association*—annual subscription—$6.

Sports Association—entrance fee—$6.

Students' Representative Council—annual subscription—$8.

Miscellaneous—annual fee—$2.

Examinations conducted under special circumstances—$11 for each subject.

Review of examination result—$11 for each subject.

LATE FEES

Fees paid from the commencement of 3rd week of the session to 30th March $20

Fees paid after 30th March where accepted with the express approval of the College Secretary $40

Initial Registration—Research Degrees

Fees paid from commencement of sixth week after date of offer of registration to end of eighth week $20

WITHDRAWAL

1. Students withdrawing from a course are required to notify the College Secretary in writing. Fees for the course accrue until a written notification is received.

2. Where notice of withdrawal from a course is received by the College Secretary before the first day of Session 1 a refund of all fees paid will be made.

3. Where a student terminates for acceptable reasons a course of study within 30 days of the commencement of first session a refund of fees paid, in respect of, the College Union Entrance and membership fees, the Students' Representative Council fee, the Sports Association fee, and the Miscellaneous fee, may be made as shown hereunder.

4. Where a student terminates a course of study after 30 days from the commencement of first session, no refund may be made.

* Life members of these bodies are exempt from the appropriate fee or fees.

5. On notice of withdrawal within 30 days, a partial refund of fees is made on the following basis:

College Union—$9.25.

Students' Representative Council—$4.

Sports Association—a full refund.

Miscellaneous—a full refund.

6. Where initial registration is made at commencement of Session 2 in any year and the student subsequently withdraws, a refund of fees based on the above rules may be made.

POSTGRADUATE SCHOLARSHIPS*

University Postgraduate Scholarships

The University provides each year a number of scholarships for postgraduate study and research in any approved field.

These awards are normally for graduates of Australian Universities who are domiciled in Australia. They are tenable for one year and, subject to satisfactory progress, may be renewed annually to provide a maximum tenure of two years in the case of a scholar registered for the degree of Master. In the case of a scholar registered for the degree of Doctor of Philosophy the award is tenable for up to a maximum of three years, but an extension for one year may be granted if special circumstances apply.

Stipend—Scholars will receive a stipend at the rate of $2,900* per annum, with a dependants' allowance at the rate of $650 for dependant wife and first child, and $234 for each other child.

Travel Allowance—In some cases a travel allowance (equivalent to a tourist air fare where appropriate) may be paid for a scholar who is obliged to move from one Australian city to another in order to take up his award. Travel allowance is also payable for dependants.

Establishment Allowance—In some cases an allowance of $100 will be paid to married scholars, and $50 to single scholars, who are entitled to a Travel Allowance. The establishment allowance is intended to assist scholars with removal expenses and with the expenses of setting up new quarters.

Thesis Allowance—In some cases a scholar may claim reimbursement of an amount of up to $100 to assist with thesis costs. Where two theses are submitted (Master followed by PhD) two claims may be made but the total amount payable will not exceed $100.

Income Tax—The stipend provided by a scholarship is normally exempt from income tax.

In some cases, scholarship holders may supplement their stipends by undertaking up to a maximum of six hours' teaching or demonstrating weekly, or a total of 180 hours in a calendar year. Opportunities for such work are usually available within the University. It is expected that scholarship holders will not engage in any other form of paid employment, and will be engaged full time on the work for which the scholarship is provided.

Normally a person may not hold more than one postgraduate scholarship.

Applications should be lodged with the College Secretary by 31st October each year.

* Rates quoted are current at time of publication.

Commonwealth Postgraduate Research Awards

A number of Commonwealth Postgraduate Research Awards are available to students undertaking full-time postgraduate research at the College, leading to the degree of Master and/or PhD.

Persons permanently domiciled in Australia, who are University graduates or will graduate in the current academic year, are eligible for the awards.

Applicants should hold, or expect to obtain, at least an upper division second class honours degree or its equivalent.

Awards are tenable for one year and, subject to satisfactory progress, may be renewed annually to provide a maximum tenure of two years in the case of a scholar registered for the degree of Master. In the case of a scholar registered for the degree of Doctor of Philosophy the award is tenable for up to a maximum of three years, but an extension for one year may be granted if special circumstances apply.

Stipend is $3,050 per annum, with a dependants' allowance at the rate of $650 for dependent wife and first child, and $234 for each other child. There is provision for Establishment, Travel, Incidentals and Thesis Allowances.

The closing date for applications is 31st October each year.

Commonwealth Postgraduate Course Awards

A number of awards for full-time postgraduate study leading to the degree of Master by formal course-work are also made available by the Commonwealth Government.

Persons permanently domiciled in Australia who are under 45 years of age on 1st January of the year in which the award is to be taken up, and who are University graduates or will graduate in the current academic year, are eligible for the awards.

Applicants are expected to have an undergraduate record at better than pass level.

Stipend and allowances are as for Research Awards.

Applications close on 30th September.

Other Awards

Details of other awards and scholarships are included in the University of New South Wales Calendar. In most cases these are for postgraduate study in a specified field of research.

Applications and Enquiries

Application forms for Commonwealth and University postgraduate awards are available from the College. Applications should be lodged with the College Secretary by the specified date.

Separate application for registration as a higher degree candidate should be made on the appropriate form, in accordance with conditions applying to the particular degree.

Further enquiries may be directed to the Student Enquiries Section.

CONDITIONS OF AWARD

CONDITIONS FOR THE AWARD OF DEGREE OF DOCTOR OF PHILOSOPHY (PhD)

1. The degree of Doctor of Philosophy may be granted by the Council on the recommendation of the Professorial Board to a candidate who has made an original and significant contribution to knowledge and who has satisfied the following requirements—

Qualifications

2. A candidate for registration for the degree of Doctor of Philosophy shall—

(i) hold an honours degree from the University of New South Wales; or

(ii) hold an honours degree of equivalent standing from another approved university; or

(iii) if he holds a degree without honours from the University of New South Wales or other approved university, have achieved by subsequent work and study a standard recognised by the appropriate Faculty or Board of Studies as equivalent to honours; or

(iv) in exceptional cases, submit such other evidence of general and professional qualifications as may be approved by the Professorial Board on the recommendation of the Faculty or Board of Studies.

3. When the Faculty or Board of Studies is not satisfied with the qualifications submitted by a candidate, the Faculty or Board of Studies may require him, before he is permitted to register, to undergo such examination or carry out such work as the Faculty or Board of Studies may prescribe.

Registration

4. A candidate for registration for a course of study leading to the degree of Doctor of Philosophy shall—

(i) apply to the Registrar* on the prescribed form at least one calendar month before the commencement of the session in which he desires to register; and

(ii) submit with his application a certificate from the head of the University school† in which he proposes to study stating that the candidate is a fit person to undertake a course of study and research leading to the degree of

* At Wollongong University College, the Secretary.

† At Wollongong University College, the Head of the Department.

Doctor of Philosophy and that the school is willing to undertake the responsibility of supervising the work of the candidate and of reporting to the Faculty or Board of Studies at the end of the course on the merits of the candidate's performance in the prescribed course.

5. Subsequent to registration the candidate shall pursue a programme of advanced study and research for at least six academic sessions, save that—

(i) a candidate fully engaged in advanced study and research for his degree, who before registration was engaged upon research to the satisfaction of the Faculty or Board of Studies, may be exempted from not more than two academic sessions;

(ii) in special circumstances the Faculty or Board of Studies may grant permission for the candidate to spend not more than one calendar year of his programme in advanced study and research at another institution provided that his work can be supervised in a manner satisfactory to the Faculty or Board of Studies;

(iii) in exceptional cases, the Professorial Board on the recommendation of the Faculty or Board of Studies may grant permission for a candidate to be exempted from not more than two academic sessions.

6. A candidate who is fully engaged in research for the degree shall present himself for examination not later than ten academic sessions from the date of his registration. A candidate not fully engaged in research shall present himself for examination not later than twelve academic sessions from the date of his registration. In special cases an extension of these times may be granted by the Faculty or Board of Studies.

7. The candidate shall be required to devote his whole time to advanced study and research, save that—

(i) the Faculty or Board of Studies may permit a candidate on application to undertake a limited amount of University teaching or outside work which in its judgment will not interfere with the continuous pursuit of the proposed course of advanced study and research;

(ii) a member of the full-time staff of the University may be accepted as a part-time candidate for the degree, in which case the Faculty or Board of Studies shall prescribe a minimum period for the duration of the programme;

(iii) in special circumstances, the Faculty or Board of Studies may, with the concurrence of the Professorial Board, accept as a part-time candidate for the degree a person who is not a member of the full-time staff of the University and is engaged in an occupation which, in its

opinion, leaves the candidate substantially free to pursue his programme in a school* of the University. In such a case the Faculty or Board of Studies shall prescribe for the duration of his programme a minimum period which, in its opinion, having regard to the proportion of his time which he is able to devote to the programme in the appropriate University school* is equivalent to the six sessions ordinarily required.

8. Every candidate shall pursue his programme under the direction of a supervisor appointed by the Faculty or Board of Studies from the full-time members of the University staff. The work, other than field work, shall be carried out in a school* of the University save that in special cases the Faculty or Board of Studies may permit candidates to conduct their work at other places where special facilities not possessed by the University may be available. Such permission will be granted only if the direction of the work remains wholly under the control of the supervisor.

9. Not later than two academic sessions after registration the candidate shall submit the topic of his research for approval by the Faculty or Board of Studies. After the topic has been approved it may not be changed except with the permission of the Faculty or Board of Studies.

10. A candidate may be required by the Faculty or Board of Studies to attend a formal course of study appropriate to his work.

Thesis

11. On completing his course of study every candidate must submit a thesis which complies with the following requirements—

(i) the greater proportion of the work described must have been completed subsequent to registration for the PhD degree;

(ii) it must be an original and significant contribution to the knowledge of the subject;

(iii) it must be written in English except that a candidate in the Faculty of Arts may be required by the Faculty on the recommendation of the supervisor to write the thesis in an appropriate foreign language;

(iv) it must reach a satisfactory standard of expression and presentation.

12. The thesis must present the candidate's own account of his research. In special cases work done conjointly with other persons may be accepted, provided the Faculty or Board of Studies is satisfied on the candidate's part in the joint research.

* Department at Wollongong University College.

13. Every candidate shall be required to submit with his thesis a short abstract of the thesis comprising not more than 300 words.

14. A candidate may not submit as the main content of his thesis any work or material which he has previously submitted for a University degree or other similar award.

Entry for Examination

15. The candidate shall give in writing two months' notice of his intention to submit his thesis and such notice shall be accompanied by the appropriate fee.

16. Four copies of the thesis shall be submitted together with a certificate from the supervisor that the candidate has completed the course of study prescribed in his case. The four copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.* The candidate may also submit any work he has published whether or not such work is related to the thesis.

17. It shall be understood that the University retains the four copies of the thesis submitted for examination, and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

18. There shall normally be three examiners of the thesis, appointed by the Professorial Board on the recommendation of the Faculty or Board of Studies, at least one of whom shall be an external examiner.

19. After examining the thesis the examiners may—

(i) decide that the thesis reaches a satisfactory standard; or

(ii) recommend that the candidate be required to re-submit his thesis in revised form after a further period of study and/or research; or

(iii) recommend without further test that the candidate be not awarded the degree of Doctor of Philosophy.

20. If the thesis reaches the required standard, the examiners shall arrange for the candidate to be examined orally, and, at their discretion, by written papers and/or practical examinations on the subject of the thesis and/or subjects relevant thereto,

* See later.

save that on the recommendation of the examiners the Faculty or Board of Studies may dispense with the oral examination.

21. If the thesis is of satisfactory standard but the candidate fails to satisfy the examiners at the oral or other examinations, the examiners may recommend the University to permit the candidate to re-present the same thesis and submit to a further oral, practical or written examination within a period specified by them but not exceeding eighteen months.

22. At the conclusion of the examination, the examiners will submit to the Faculty or Board of Studies a concise report on the merits of the thesis and on the examination results, and the Faculty or Board of Studies shall recommend whether or not the candidate may be admitted to the degree.

23. A candidate shall be required to pay such fees as may be determined from time to time by the Council.

CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF ARTS (MA)

1. An application to register as a candidate for the degree of Master of Arts shall be made on the prescribed form which shall be lodged with the Registrar° at least one full calendar month before the commencement of the session in which the candidate desires to register.

2. A candidate for the degree shall be registered in one of the following Schools* of the Faculty of Arts: Drama, Economics, English, French, Geography, German, History, History and Philosophy of Science, Mathematics,† Philosophy, Political Science, Psychology, Russian, Sociology, Spanish.

3. The degree shall be awarded in two grades, namely the Pass degree and the degree with Honours. There shall be two classes of Honours, namely Class I and Class II.

4. A candidate for the Honours degree may not be awarded the Pass degree.

5. *Honours Degree*

(i) Except as provided in sub-section 5 (ii) an applicant for registration for the Honours degree of Master of Arts

° The Secretary at Wollongong University College.

* Departments at Wollongong University College.

† The School of Mathematics includes a Department of Statistics.

shall have been admitted to the degree of Bachelor of Arts at a standard not below second class honours in the University of New South Wales, or other approved University, in an appropriate School or Department.

(ii) Applicants for registration for the Honours degree who are graduates in Arts of this, or other approved University, with a degree at a standard below second class honours shall be required to take a qualifying examination as approved by the Faculty of Arts (hereinafter referred to as "the Faculty"), and if successful may then apply for registration as a candidate for the Honours degree.

(iii) Notwithstanding any other provisions of these conditions the Faculty may, on the recommendation of the Head of the School,‡ require an applicant to demonstrate fitness for registration as a candidate for the Honours degree by carrying out such work and passing such examinations as the Faculty may determine. The Faculty may on the recommendation of the Head of the School‡ concerned require a candidate for the Honours degree to undergo a suitable test in a relevant language, the form of such test to be recommended by the Head of the School‡ concerned.

(iv) Every candidate for the Honours degree shall be required to submit three copies of a thesis embodying the results of an original investigation, to take such examinations and to perform such other work as may be prescribed by the Faculty on the recommendation of the Head of the School* concerned. A candidate for the Honours degree may not submit as the main content of his thesis any work or material which he has previously submitted for a University degree or other similar award. The Honours thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.†

(v) It shall be understood that the University retains three copies of the Honours thesis submitted for examination and may allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968 the University may issue the Honours thesis in whole or in part in photostat or microfilm or other copying medium.

(vi) The investigation and other work as provided in paragraph 5 (iv) shall be carried out under the direction of a supervisor appointed by the Faculty or under such conditions as the Faculty may determine.

‡ At Wollongong University College, the Head of the Department.

* At Wollongong University College, the Head of the Department.

† See later.

(vii) For each candidate for the Honours degree there shall be at least two examiners appointed by the Professorial Board on the recommendation of the Faculty, one of whom shall, if possible, be an external examiner.

(viii) Every candidate for the Honours degree shall in the first instance submit his proposed course of study and the subject of his thesis for the approval of the Head of the School* concerned.

(ix) No candidate shall be considered for the award of the Honours degree until the lapse of three complete sessions from the date from which registration becomes effective, save that in the case of a candidate who has demonstrated exceptional merit this period may, with the approval of the Faculty, be reduced by one session.

6. *Pass Degree*

(i) Unless the Faculty shall otherwise determine, an applicant for registration as a candidate for the Pass degree of Master of Arts shall have been admitted to the degree of Bachelor of Arts in the University of New South Wales or other approved university and shall have taken a major sequence, and passed all necessary examinations, in the subject or subjects, or in a discipline related to the subject or subjects, in which he wishes to work for the Pass degree.

(ii) Notwithstanding the provisions of clause 6 (i) the Faculty may, on the recommendation of the Head of the School,* require an applicant to demonstrate his eligibility for registration by carrying out such work and passing such examinations as the Faculty may determine.

(iii) A candidate for the Pass degree shall attend such classes and seminars as may be prescribed, shall pass the required examinations, and shall complete satisfactorily such written and other work as the Head of School* may determine.

(iv) No part-time candidate shall be considered for the award of the Pass degree until the lapse of four complete sessions from the date from which registration becomes effective. No full-time candidate shall be considered for the award of the degree until the lapse of two sessions from the date from which registration becomes effective.

7. (i) A graduate in a Faculty other than Arts of this or other approved university may be admitted to registration for the Honours or Pass degree of Master of Arts, with the approval of the Faculty.

† The Head of the Department at Wollongong University College.

(ii) In special circumstances a person may be permitted to register as a candidate for the Honours or Pass degree of Master of Arts if he submits evidence of such academic and professional attainments as may be approved by the Faculty on the recommendation of its Higher Degree Committee.

8. In every case, before permitting an applicant to register as a candidate the Faculty shall be satisfied that adequate supervision and facilities are available.

9. No candidate shall, without the approval of the Head of the School* concerned, be enrolled as a candidate for the degree of Master of Arts at the same time as he is enrolled for any other degree or diploma in this University or elsewhere.

10. An approved applicant shall pay such fees as may be determined from time to time by the Council.

CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF COMMERCE (MCom)

1. An application to register as a candidate for the degree of Master of Commerce shall be made on the prescribed form which shall be lodged with the Registrar† at least two full calendar months before the commencement of the session in which the candidate desires to register.

2. (i) An applicant for registration for the degree shall have been admitted to the degree of Bachelor of Commerce in the University of New South Wales or to an appropriate degree of any other approved University.

(ii) In special circumstances a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty of Commerce (hereinafter referred to as "the Faculty") on the recommendation of the Higher Degree Committee.

3. Notwithstanding any other provisions of these conditions the Faculty may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Faculty may determine.

4. In every case, before permitting an applicant to register as a candidate the Faculty shall be satisfied that adequate supervision and facilities are available.

* The Head of the Department at Wollongong University College.

† The Secretary at Wollongong University College.

5. An approved applicant shall register in one of the following categories:

(i) student in full-time attendance at the University;

(ii) student in part-time attendance at the University;

(iii) student working externally to the University;

and shall pay such fees as may be determined from time to time by the Council. Registration as a student working externally will be permitted only in cases where adequate arrangements can be made for external supervision. Course work can not be taken externally.

6. The requirements for the degree of Master of Commerce may be satisfied in either of two ways. Candidates who have a distinguished first degree and who provide evidence of research ability may be permitted to present themselves for examination by thesis only. Other candidates shall be required to follow a programme which places less emphasis on research and more on formal instruction.

7. A candidate presenting himself for examination by thesis only shall, upon application for registration, submit the title and outline of the proposed field of research. The research and investigation shall be carried out under the direction of a supervisor appointed by the Faculty and the results thereof shall be embodied in a thesis. No candidate shall be considered for the award of the degree until the lapse of four complete sessions from the date on which the registration becomes effective, save that in the case of a candidate who has obtained the degree of Bachelor with honours or who has had previous research experience, this period may, with the approval of the Faculty, be reduced by up to two sessions.

8. A candidate following a formal course of study leading to the degree shall:

(i) undertake a course of formal study prescribed by Faculty as set out in the "Course Requirements for the Master of Commerce Degree", save that a candidate who has obtained an appropriate degree at honours level may be given credit for honours course work. The course of formal study will extend over two full-time or three part-time years;

(ii) except in exceptional circumstances pass at the first attempt all examinations prescribed by the Faculty;

(iii) submit a report on a topic approved by Faculty. The report will normally be submitted at the end of the second full-time or third part-time year.

(iv) obtain an average of credit or better in the subjects listed below in respect of the school or department in which he is pursuing his studies as a condition for proceeding to completion of the degree, providing that a candidate who has passed at a standard below the required average may be permitted to present again such subject or subjects as the head of school or department approves. The subjects referred to above are:

School of Accountancy:

*14.951G Current Developments in Accounting Thought—Financial

*14.952G Current Developments in Accounting Thought—Managerial

School of Economics:

Economics Graduate Course—
*15.154G Microeconomic Analysis I
*15.174G Microeconomic Analysis I

Econometrics Graduate Course—
*15.454G Simultaneous Equation Techniques
*15.474G Mathematical Economics A

School of Marketing:

*28.203 Seminar in Marketing Theory I
*28.205 Methods of Marketing Research

9. (i) Every candidate shall submit three copies of the thesis or report. All copies shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.† A candidate may submit also for examination any work he has published whether or not such work is related to the thesis.

(ii) It shall be understood that the University retains three copies of the thesis or report submitted for examination and is free to allow the thesis or report to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968 the University may issue the thesis or report in whole or in part, in photostat or microfilm or other copying medium.

10. For each candidate's thesis or report there shall be two examiners appointed by the Professorial Board on the recommendation of the Faculty, one of whom shall in the case of a thesis, be an external examiner.

* Subject numbers apply to subjects offered by the University of New South Wales (Kensington) only.

† See later.

CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF ENGINEERING (ME)

1. The degree of Master of Engineering may be granted by the Council on the recommendation of the Professorial Board to a candidate who has demonstrated ability to carry out research by the submission of a thesis embodying the results of an original investigation.

2. An application to register as a candidate for the degree of Master of Engineering shall be made on the prescribed form which shall be lodged with the Registrar* at least one full calendar month before the commencement of the session in which the candidate desires to register.

3. (i) An applicant for registration for the degree shall have been admitted to the degree of Bachelor in the University of New South Wales, or other approved University, in an appropriate school.

(ii) In exceptional cases a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainment as may be approved by the Professorial Board on the recommendation of the appropriate Faculty (hereinafter referred to as "the Faculty").

4. Notwithstanding any other provisions of these conditions, the Faculty may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Faculty may determine.

5. In every case, before permitting an applicant to register as a candidate, the Faculty shall be satisfied that adequate supervision and facilities are available.

6. An approved applicant shall register in one of the following categories:—

(i) student in full-time attendance at the University;

(ii) student in part-time attendance at the University;

(iii) student working externally to the University;

and shall pay such fees as may be determined from time to time by the Council.

7. Every candidate for the degree shall be required to carry out a programme of advanced study, to take such examinations and perform such other work as may be prescribed by the Faculty.

* The Secretary at Wollongong University College.

The programme shall include the preparation and submission of a thesis embodying the results of an original investigation, three copies of which shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.* The candidate may submit any work he has published whether or not such work is related to the thesis.

8. It shall be understood that the University retains the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968 the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

9. The investigation and other work as provided in paragraph 7 shall be carried out under the direction of a supervisor appointed by the Faculty or under such conditions as the Faculty may determine.

10. No candidate shall be considered for the award of the degree until the lapse of four complete sessions from the date from which registration becomes effective save that, in the case of a candidate who obtained the degree of Bachelor with Honours or who has had previous research experience, this period may, with the approval of Faculty, be reduced by up to two sessions.

11. For each candidate there shall be at least two examiners appointed by the Professorial Board on the recommendation of the Faculty, one of whom shall, if possible, be an external examiner.

CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF ENGINEERING SCIENCE (MEngSc)

1. The degree of Master of Engineering Science may be awarded by the Council on the recommendation of the Professorial Board to a candidate who has

(i) completed a programme of advanced study which may include the submission of a report on a project based upon a design or a critical review; or

(ii) demonstrated ability to carry out research by the submission of a thesis embodying the results of an original investigation; or

(iii) completed an approved combination of the above.

* See later.

2. (i) An application to register for the degree shall be made on the prescribed form which shall be lodged with the Registrar† at least one full calendar montn before the commencement of the course.

(ii) An applicant for registration shall indicate the proposed project area or major field of study in order that the responsibility for the supervision of the programme may be determined.

3. (i) An applicant for registration for the degree shall have been admitted to the degree of Bachelor with Honours in the University of New South Wales or other approved University in an appropriate school or department.

(ii) A graduate with a pass degree of good standing from an appropriate degree course may be admitted on the recommendation of the Head of School† and the confirmation of Faculty.

(iii) In special circumstances a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty on the recommendation of its Higher Degree Committee.

4. Notwithstanding any other provisions of these conditions, the Faculty may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Faculty may determine.

5. The programme of advanced study including the preparation of a thesis or report on a project to be completed by each candidate shall total a minimum of 36 credits, the number of credits allocated for each subject being determined by Faculty on the recommendation of Heads of Schools. Where the formal coursework comprises no more than 50% of the total study, the candidate will be required to submit a research thesis and where the formal work comprises more than 50% but less than 100% the candidate will be required to submit a report on a project. With the approval of the Head of School candidates may take subjects from other Schools of the Faculty, other Faculties of the University and other Universities or Institutions.

6. The approval of the appropriate Head of School for the proposed programme must be obtained by the candidate prior to enrolment. For the purpose of this regulation the Head of School will normally be the Head of the School providing supervision of the project or research, or if there is no project the major field of study.

† The Head of the Department at Wollongong University College.

7. An approved candidate shall register in one of the following categories:

(i) student in full-time attendance at the University,

(ii) student in part-time attendance at the University,

and shall pay such fees as may be determined from time to time by Council.

8. No full-time candidate shall be considered for the award of the degree until the lapse of two sessions from the date from which registration becomes effective. No part-time candidate shall be considered for the award of the degree until the lapse of four sessions from the date from which registration becomes effective.

9. (i) The project forming the basis for the thesis or report shall be conducted under a supervisor appointed by the Faculty or under such conditions as Faculty may determine, to the satisfaction of the Head of School.

(ii) For each candidate who submits a thesis as provided in paragraph 1 (ii) there shall be at least two examiners appointed by the Professorial Board on the recommendation of Faculty, one of whom shall, if possible, be an external examiner.

(iii) The report on the project provided in paragraph 1 (i) shall be examined by two examiners.

10. Every candidate who submits a thesis as provided in paragraph 1 (ii) shall submit three copies in a form which complies with the requirements of the University for the preparation and submission of higher degree theses*. The candidate may also submit any work he has published whether or not such work is related to the thesis. The format of the report on a project as provided in paragraph 1 (i) shall comply with the requirements of the Faculty for the preparation and submission of project reports.

11. The examiners referred to in paragraphs 9 (ii) and 9 (iii) shall submit to the Faculty a report on the merits of the project report or thesis, and the Faculty shall recommend whether or not the candidate be admitted to the degree.

Faculty of Engineering Requirements for Preparation of Project Reports

(i) Two copies of the written part of the report should be submitted, typed double spaced on one side of good quality foolscap or quarto-sized paper.

(ii) The margins on each sheet shall be not less than 1½ inches on the left-hand side, ½ inch on the right-hand side, 1 inch at the top and ¾ inch at the bottom.

(iii) There should be a title sheet showing project report title, author's name, degree and date of submission.

* See later.

(iv) Sheets shall be numbered consecutively.

(v) Unless otherwise specifically instructed by the supervisor, diagrams, charts, etc., should be included, where possible, with the text, facing the page on which reference to them is made otherwise they may be clearly referred to in the text, numbered and folded for insertion in a pocket on the back cover of the project report. Folding diagrams or charts included in the text should be arranged to open out to the top and to the right.

(vi) All drawings which are separately bound shall be of double elephant size (27 inches by 40 inches) and shall have a margin at least 1 inch wide on the left-hand side to permit binding.

(vii) The drawings shall be bound together by a row of clips on the left-hand side and shall have a clear sheet of drawing paper on top and underneath. On the top sheet shall be printed the words "The University of New South Wales—Master of Engineering Scienoe Degree", and a description of the project, e.g., "Highway Design Project", and underneath that the date submitted. On the bottom right-hand corner shall be printed the name of the candidate.

(viii) Drawings may be originals on cartridge paper or black and white prints. They should be suitably coloured where appropriate and it will be permissible to add extra work in ink to original drawings.

(ix) Two copies of all drawings will be required normally. Exceptions to this direction shall be granted only on the recommendation of the Higher Degree Committee.

(x) Wherever practicable, all units shall be SI units.

CONDITIONS FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE (MSc)

1. The degree of Master of Science may be granted by the Council on the recommendation of the Professorial Board to a candidate who has demonstrated ability to undertake research by the submission of a thesis embodying the results of an original investigation.

2. An application to register as a candidate for the degree of Master of Science shall be made on the prescribed form which shall be lodged with the Registrar* at least one full calendar month before the commencement of the session in which the candidate desires to register.

3. (i) An applicant for registration for the degree shall have been admitted to the degree of Bachelor of Science in the University of New South Wales, or other approved University, in an appropriate School or Department.

* The Secretary at Wollongong University College.

(ii) In exceptional cases a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Professorial Board on the recommendation of the appropriate Faculty or Board of Studies.

4. Notwithstanding any other provisions of these conditions the Faculty or Board of Studies may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Faculty or Board of Studies may determine.

5. In every case before permitting an applicant to register as a candidate the Faculty or Board of Studies shall be satisfied that adequate supervision and facilities are available.

6. An approved applicant shall register in one of the following categories:

(i) student in full-time attendance at the University;

(ii) student in part-time attendance at the University;

(iii) student working externally to the University;

and shall pay such fees as may be determined from time to time by the Council.

7. Every candidate for the degree shall be required to submit three copies of a thesis embodying the results of an original investigation or design, to take such examinations and to perform such other work as may be prescribed by the Faculty or Board of Studies. The thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.* The candidate may submit also for examination any work he has published whether or not such work is related to the thesis.

8. It shall be understood that the University retains the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968 the University may issue the thesis in whole or in part in photostat or microfilm or other copying medium.

9. The investigation, design and other work as provided in paragraph 7 shall be carried out under the direction of a supervisor appointed by the Faculty or Board of Studies or under such conditions as the Faculty or Board of Studies may determine.

10. No candidate shall be considered for the award of the degree until the lapse of four complete sessions from the date from which registration becomes effective, save that in the case of a candidate who obtained the degree of Bachelor with Honours or who has had previous research experience this period may, with the approval of the Faculty or Board of Studies, be reduced by up to two sessions.

* See later.

11. For each candidate there shall be at least two examiners appointed by the Professorial Board, on the recommendation of the Faculty or Board of Studies, one of whom shall, if possible, be an external examiner.

CONDITIONS FOR THE DEGREE OF MASTER OF SCIENCE OR MASTER OF ENGINEERING WITHOUT SUPERVISION

Where it is not possible for candidates to register under the existing conditions for the degree of Master of Science or Master of Engineering by reason of their location at centres which are distant from University Schools* or where effective supervision is not practicable, registration may be granted in these categories under the following conditions:

1. An application to register as an external candidate for the degree of Master of Science or Master of Engineering without supervision shall be lodged with the Registrar† for recommendation by the Head of School‡ and consideration by the Faculty, not less than six months before the intended date of submission of the thesis. A graduate who intends to apply in this way should in his own interest at an early stage, seek the advice of the appropriate School* with regard to the adequacy of the subject matter for the degree. A synopsis of the work should be enclosed.

2. An applicant for registration shall have been admitted to a degree of Bachelor in the University of New South Wales.

3. An approved applicant shall pay such fees as may be determined from time to time by the Council.

4. (i) Every candidate for the degree shall be required to submit three copies of a thesis embodying the results of an original investigation or design. The thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.§ A candidate may submit also for examination any work he has published, whether or not such work is related to the thesis.

(ii) Every candidate shall submit with the thesis a statutory declaration that the material contained therein is his own work, except where otherwise stated in the thesis.

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* Departments at Wollongong University College.

† The Secretary at Wollongong University College.

‡ At Wollongong University College, the Head of Department.

§ See later.

5. It shall be understood that the University retains the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the Copyright Act, 1968 the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

6. A candidate shall not be considered for the award of the degree until the lapse of six sessions in the case of honours graduates and eight sessions in the case of pass graduates from the date of graduation.

7. For each candidate there shall be at least two examiners appointed by the Professorial Board on the recommendation of the appropriate Faculty, one of whom shall be an internal examiner.

8. If the thesis reaches the required standard the candidate shall be required to attend for an oral examination at a time and place nominated by the University. The examiners may also arrange at their discretion for the examination of the candidate by written and/or practical examinations on the subject of the thesis and/or subjects related thereto.

PREPARATION AND SUBMISSION OF THESES FOR HIGHER DEGREES

1. (a) Every candidate for the degree of Master in which a thesis is required except Master of Surgery shall submit to the Registrar* three copies of the thesis and supporting work, together with a certificate from the supervisor to the effect that the thesis is in a form suitable for submission to the examiner. All copies of the thesis shall include a summary of approximately 200 words and a certificate signed by the candidate to the effect that the work has not been submitted for a higher degree to any other university or institution.

   (b) Every candidate for the degree of Master of Surgery shall submit to the Registrar four copies of the thesis and supporting work, together with a certificate from the supervisor to the effect that the thesis is in a form suitable for submission to the examiner. All copies of the thesis shall include a summary of approximately 200 words and a certificate signed by the candidate to the effect that the work has not been submitted for a higher degree to any other university or institution.

   (c) Every candidate for the degree of Doctor of Philosophy shall submit to the Registrar four copies of the thesis and supporting work, together with a certificate from the supervisor to the effect that the thesis is in a form suitable for submission to the examiner. All copies of the thesis shall contain a short abstract of the thesis comprising not more than 300 words.

   (d) Every candidate for the degree of Doctor of Medicine shall submit to the Registrar four copies of the thesis and supporting work, together with a certificate from the supervisor to the effect that the thesis is in a form suitable for submission to the examiner. All copies of the thesis shall contain a short abstract of the thesis comprising not more than 400 words which inter alia shall indicate wherein the thesis has made an original contribution.

2. The specifications currently approved for higher degree theses are as follows and any variation must be approved by the supervisor in consultation with the Registrar and the University Librarian:

   (a) All copies of the thesis shall be in double-spaced typescript on one side of the paper only.

   (b) The size of the paper shall approximate International Standards Organization paper size B5 (25 cm. x 17.6 cm.) or the size commonly called quarto except for illustrative material such as drawings, maps and printouts, on which no restriction is placed.

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(c) The margins on each sheet shall be not less than 4 cm. on the left-hand side, 2 cm. on the right-hand side, 3 cm. at the top and 2 cm. at the bottom.

(d) There shall be a title sheet showing thesis title, author's name, degree and year of submission.

(e) Pages or leaves shall be numbered consecutively.

(f) Diagrams, charts, etc., must not be submitted on the back of typed sheets.

Unless otherwise specifically permitted by the supervisor, diagrams, charts, etc. shall be included, where possible, with the text, facing the page on which reference to them is made, otherwise they must be clearly referred to in the text, numbered and folded for insertion in a pocket on the back inside cover of the thesis binding. All loose material shall be marked with the author's name, initials, and degree for which the work is submitted in such a way that it can readily be linked with the thesis. Folded diagrams or charts included in the text shall be arranged so as to open out to the top and left. Photographic prints shall be securely fixed in the thesis. They shall either be printed on single weight printing paper, preferably not glazed, or mounted on cartridge paper for binding.

3. One copy of the thesis is for deposit in the University Library and shall be presented in a permanent and legible form, either in *original* typescript, "stencil copy" or printed copy. A copy produced by dye line "thermofax" or xerographic processes is *not* acceptable for deposit in the Library.

The paper used in all copies shall be of good quality and sufficiently opaque for normal reading.

The Library deposit copy shall be bound in accordance with the following specifications:

The thesis shall be bound in boards, covered with buckram. The bound volume shall be lettered on the spine as follows:

(a) At the bottom and across—UNSW, or if the volume is too thin for this— U
NSW

(b) 7 cm. from the bottom and across, with the degree and year of submission of the thesis, for example—
MSc
1960

(c) Evenly spaced between the statement of the degree and year and the top of the spine the name of the author, initials first and then surname, reading upwards in one line.

No further lettering or any decoration is required on the spine or anywhere on the binding. In the binding of theses which include mounted photographs, folded graphs and so on, leaves at the

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spine shall be packed to ensure even thickness of the volume. *The Library copy of the thesis shall be bound by one of a panel of approved bookbinders, each of whom is aware of the University's requirements. Names of approved bookbinders may be secured from the Admissions and Higher Degrees Section.*

A completed and signed Declaration Relating to Disposition of Thesis form shall be pasted to the inside of the front cover of the library-deposit copy. The form may be obtained from the Admissions and Higher Degrees Section.

The other copies of the thesis shall be bound in such a manner as allows their transmission to the examiners without possibility of their disarrangement.

4. The thesis and other relevant work may be submitted to the Registrar* with the examination fee at any time during the year provided the candidate has completed the minimum period of registration. In order that a successful candidate may have a reasonable chance of having the degree conferred at one of the formal degree-conferring ceremonies, the candidate should arrange for the thesis and other relevant work to be in the hands of the Registrar* at least eighteen weeks prior to the date of such ceremony.

Policy with Respect to the Use of Higher Degree Theses

The University holds that no thesis submitted for a higher degree should be retained in the Library for record purposes only, but within copyright privileges of the author, should be public property and accessible for consultation at the discretion of the Librarian.

Declarations Controlling Use of Thesis

In order to ascertain the wishes of a candidate for a higher degree regarding the use to which his thesis may be put, he is required to complete a declaration (obtainable from the Registrar) which would (1) grant the University Librarian permission to publish or to authorize the publication of the thesis (Form 1); (2) withhold the right of the University Librarian to publish the thesis (Form 2); or (3) allow the University Librarian to publish the thesis under certain conditions.

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CONDITIONS OF AWARD—GRADUATE DIPLOMAS

1. An application for admission to a graduate diploma course shall be made on the prescribed form which shall be lodged with the Registrar* at least two full calendar months before the commencement of the course.

2. An applicant for admission to a graduate diploma course shall be—

(a) a graduate of the University of New South Wales or other approved university,

(b) a person with other qualifications as may be approved by Faculty.

3. Notwithstanding clause (2) above, Faculty may require an applicant to take such other prerequisite or concurrent studies and/or examinations as it may prescribe.

4. Every candidate for a graduate diploma shall be required to undertake the appropriate course of study, to pass any prescribed examinations, and if so laid down in the course, to complete a project or assignment specified by the Head of the School.† The format of the report on such project or assignment shall accord with the instructions laid down by the Head of the School.†

5. An approved applicant shall be required to pay the fee for the course in which he desires to register. Fees shall be paid in advance.

* The Secretary at Wollongong University College.

† At Wollongong University College, the Head of the Department.

DETAILS OF COURSEWORK

MASTER OF ARTS (PASS)—ENGLISH

Students must complete four subjects (two in each of the two years). Each subject will involve at least 30 hours of seminars, together with such supplementary study of criticism, research-materials and methods as may be prescribed from time to time. Students will be expected to undertake wide reading in preparation for each seminar and must, as required, write papers to be presented at the seminars. Assessment will be based on these papers as well as on examinations at the end of each session, and a long essay (approximately 10,000 words) to be handed in at the end of the second session.

Two subjects will be offered in 1974 provided that the necessary staff is available; and new subjects will be added from time to time in such fields as Modern American Literature, Nineteenth-Century Australian Literature, Linguistic History and Theory, and European Fiction and Drama in English translation.

The Head of the Department reserves the right to place a limit on numbers in particular subjects, and to advise candidates on the subjects best suited to their qualifications and purposes.

FIRST SESSION

Modern Poetry from Hardy to Auden: A study of the poems of such writers as Hardy, Yeats, Frost, Stevens, Pound, T. S. Eliot, E. E. Cummings and Auden.

SECOND SESSION

Modern Poetry from Louis MacNeice to Sylvia Plath: A study of the poems of such writers as MacNeice, A. D. Hope, Dylan Thomas, Robert Lowell, Philip Larkin, Allen Ginsberg, Peter Porter and Sylvia Plath.

MASTER OF ARTS (PASS)—HISTORY

Candidates enrolled for the Pass MA degree in History will participate in a minimum of two seminar discussion hours each week for two academic years. They will be required to write such essays as may be set.

The course offered in 1974 will be entitled "Comparative social history: nineteenth and twentieth century England and Australia".

Normally admission to the course will be restricted to applicants who have received two credit ratings, or better, in History in their undergraduate career.

MASTER OF ENGINEERING SCIENCE (Mechanical Engineering)

The School of Civil, Mechanical and Mining Engineering offers a course leading to the degree of Master of Engineering Science in Mechanical Engineering.

This course provides advanced study and research in selected areas, and is made up of a programme of formal work selected from the subjects listed below together with research work.

	Credit Hours
Advanced Dynamics	4
Advanced Heat Transfer I	4
Advanced Heat Transfer II	4
Advanced Mechanics of Solids I	4
Advanced Mechanics of Solids II	4
Bulk Solids Handling Systems I	3
Bulk Solids Handling Systems II	3
Computational Methods in Mech. Eng I	2
Computational Methods in Mech. Eng. II	2
Gas Dynamics and Compressible Fluid Flow	6
Optimum Design for Mechanical Engineers	2
Statistical Thermodynamics	4
Theory of Elasticity	4
Systems Engineering I	3
Systems Engineering II	3
Systems Engineering III	3

The normal length of the course is one full-time year (two sessions) or two part-time years, amounting in each case to approximately forty-two credit hours (one credit hour being normally equal to one hour per week for one session). Of this not less than eighteen and not more than thirty-six credit hours shall be devoted to formal course work. Students for whom additional prerequisite or co-requisite courses have been prescribed must expect their course to exceed the minimum period. The maximum period allowed for completion of the course is two years for full-time students and four years for part-time students.

It is expected that no less than two-thirds of the formal credit hours will be earned within a single field of engineering science, which will be regarded as the student's major field of study.

Areas from which research topics may be selected are to some extent indicated by the foregoing list of subjects. The topic will be determined after discussion between the student and his proposed Supervisor (who is nominated after the student has indicated his area of interest).

Students should recognise that they must be prepared to spend a number of hours regularly each week on their research, a matter of some difficulty for part-time students, unless they are willing and able to devote at least some day-time hours to the purpose. This will be considered essential in the case of experimental research.

DESCRIPTION OF SUBJECTS

ADVANCED DYNAMICS

(4 credit hrs.)

Kinematics and dynamics of particles and rigid bodies in three-dimensional motion: Fixed and moving reference frames; Newtonian dynamics; inertia tensor; Euler's equations of motion; general motion of gyroscopes and rigid bodies in space.

Calculus of variations: Functions and functionals; stationary values of integrals; Euler-Lagrange equation; constraints and Lagrange multipliers; fixed and variable end points; problems of Lagrange Mayer and Bolza.

Variational dynamics: Performance optimisation; generalised co-ordinates; Lagrange equation; Hamilton's principle; impulsive motion; oscillatory motion.

ADVANCED HEAT TRANSFER I

(4 credit hrs.)

Fluid Dynamics: Mass continuity equations; Navier-Stokes equations, their general properties and exact solutions; boundary layer theory; laminar, transition and turbulent flow; equations of motion; exact solutions of boundary layer parameters for laminar flow; turbulence; Reynolds stresses; eddy diffusivity theory; mixing length theories; Prandtl's momentum transfer theory; Taylor's vorticity transfer theory; Von Karman's similarity hypothesis; boundary layer parameters for turbulent flow; velocity defect law; universal velocity distribution; application to turbulent flow in circular pipes; velocity distributions and resistance formulae for hydraulically smooth and rough pipes; integral method for approximate boundary layer analysis; Von Karman's momentum equation; application to laminar and turbulent boundary layers; boundary layers with pressure gradient; separate and vortex formation; boundary layer control; drag and pressure distribution relationships for bluff bodies.

HEAT TRANSFER BY CONVECTION

A. General: Introduction; heat, mass and momentum transport; methods of evaluation of the convective heat transfer coefficient; dimensional analysis; physical interpretation of parameters; correlation of experimental data; theory of similarity in heat transfer; energy equation; thermal boundary layers in laminar flow; general properties; exact solutions of temperature distributions; integral method as an approximate analyses of thermal boundary layers in laminar flow; heat and momentum transfer in turbulent flow; the Reynolds analogy; the Taylor-Prandtl analogy; the Von Karman analogy; the turbulent Prandtl number, the Stanton number.

B. Free Convection: Similarity parameters; velocity and temperature fields; correlation of data for vertical, horizontal and sloping surfaces; evaluations of heat flow for geometric shapes of practical interest; laminar and turbulent flow cases; convection caused by centrifugal forces; convection from rotating bodies.

C. Forced Convection: Velocity and temperature fields in closed conduits; effect of similarity parameters on heat transfer; heat transfer coefficients for laminar and turbulent flow; semi-empirical equations and working formulae; flow over exterior surfaces; separated flow; application to flow over a bank of tubes; heat exchanger design and selection; flow arrangements and effectiveness; fouling factors; heat transfer in high-speed flow, in rarefied gases and in free molecule flow.

D. Heat Transfer with change of Phase: Condensation; Nusselt's liquid-film theory; turbulent film condensation; super-heated vapours; multicomponent vapours; non-condensable gases; drop-wise condensation; experimental results and working formulae; condensation in tubes; evaporation; surface evaporation; nucleate boiling of a sub-cooled liquid; nucleate pool boiling; film boiling; burnout; experimental results and working formulae; boiling in tubes.

ADVANCED HEAT TRANSFER II

(4 credit hrs.)

Conduction: Unidimensional heat flow; analysis of extended surfaces; two and three-dimensional conduction; unsteady conduction in one or more dimensions; analytical, numerical and analogical methods of solution; transient systems; initial value and boundary value problems; nonhomogeneous bodies; anistropic bodies; variable material properties.

Radiation: Thermal radiation properties of materials, black bodies —characteristics of real solids, liquid and gases; radiation exchange between infinite surfaces and between finite surfaces shape factor for various configurations; radiation shields; re-radiating surfaces and electrical analogies; radiation behaviours of gases and vapours; pyrometry; solar radiation.

ADVANCED MECHANICS OF SOLIDS I

(4 credit hrs.)

Stresses in normally loaded flat plates and shells: Bending and deflection of long rectangular plates; bending and deflection of circular plates; bending stresses in thin-walled vessels; thermal stresses in thin-walled vessels.

Buckling: Lateral buckling of prismatic bars; energy method of calculating critical compressive loads; buckling of bars of variable cross section; effect of shearing force on the critical load; inelastic buckling of straight columns; buckling of circular rings and tubes under external pressure; buckling of beams without lateral supports; buckling of shafts by torsion; twistbend buckling, twist buckling of columns; buckling of rectangular plates.

Stresses and deformation of rotating discs: Uniform and varying thickness; uniform stress; sum and difference method; temperature gradients.

Effect of small inelastic strains on load-carrying capacity: Notched bar in tension; residual stress; beam of rectangular cross-section; torsion of prismatical bars; ultimate load analysis—simple cases; thick cylinders.

ADVANCED MECHANICS OF SOLIDS II

(4 credit hrs.)

Plasticity and metal forming: Theories of plasticity; plane strain problems in cartesian and polar co-ordinates; axially-symmetrical problems in cylindrical and spherical co-ordinates; effect of temperature strain rate and external friction on plastic deformation; applications to certain metal forming problems.

Elastic bodies in contact: Point and line contact; contact stresses; deflection of bodies in contact; effect of friction on contact stresses.

Fluctuating stresses: Endurance test; fatigue; effect of stress concentration on fatigue; mean stress, variable stress; fatigue under combined loading; theories of fatigue failure; factor of safety; corrosion fatigue.

Mechanical properties of materials at high temperature: Introduction to the mechanics of creep; deformation by creep; steady creep under general state of stress; creep under alternating stress; effect at temperature variations; stress relaxation due to creep; creep recovery.

Mechanical properties of materials at low temperature: Brittle fracture; propagation of brittle cracks; ductile-brittle transition; fracture toughness; notch ductility.

BULK SOLIDS HANDLING SYSTEMS I

(3 credit hrs.)

Flow patterns of bulk solids constrained by bins and hoppers; stress and velocity fields and theory of flow; determination of flow properties; effect of time consolidation; design of mass flow and funnel flow bins; bin loads under static and dynamic conditions; in-bin blending.

BULK SOLIDS HANDLING SYSTEMS II

(3 credit hrs.)

Conveyor systems for bulk solids—design parameters and dynamic characteristics; analysis and design of hopper/feeder systems; one and two phase flow of bulk solids; optimization and control of bulk handling systems.

COMPUTATIONAL METHODS IN MECHANICAL ENGINEERING I

(2 credit hrs.)

Programming languages, including Fortran and automatic differential equation solvers; solution of single non-linear equations; iteration; extension to simultaneous equations; systems of linear equations; direct, matrix and iterative methods; relaxation; empirical analysis; least squares, differential correction; introduction to linear programming; ordinary differential equations; series and stepwise methods; partial differential equations; solution by finite differences; iterative methods in boundary value and initial value problems.

COMPUTATIONAL METHODS IN MECHANICAL ENGINEERING II

(2 credit hrs.)

Deals with the solution of engineering problems employing the methods of systems analysis. Both lumped parameter and distributed systems are discussed. The following topics are treated:—

Problem formulation, classical time domain methods, frequency domain analysis, Fourier, Laplace and Z transforms, matrix methods and introduction to state-space analysis; phase-plane analysis applied to non-linear systems, analogue computation.

GAS DYNAMICS AND COMPRESSIBLE FLUID FLOW

(6 credit hrs.)

Thermodynamics, conservation equations, kinematics, vorticity; acoustic waves; mach number; isentropic and isenergetic flow; nozzle; wind tunnel; diffusers.

Method of characteristics; influence of friction and heat transfer; combustion in a duct; rocket motor; general one-dimensional flows; potential flow small perturbation theory; linearised theory of steady plane flow for wings and bodies; shock waves; shock polar; conical shocks; moving shocks; Prandtl-Meyer flow; Busemann series expansion method.

OPTIMUM DESIGN FOR MECHANICAL ENGINEERS

(2 credit hrs.)

Introduction, discussion of methods of optimization; mathematical functions in engineering; principles of optimum design; normal, redundant and incompatible specifications; problems with more than one primary design equation; optimum design of axially loaded members (with static and variable load); optimum design of torsion shaft for minimum weight, minimum cost, maximum cost, maximum energy absorption, maximum torque felt by machine frame, maximum power transmission; optimum design of shaft with combined loading; optimum design of gears for maximum torque transmission capability, for maximum power

transmission capability for minimum size; some typical examples of optimum design; optimization by linear programming—simplex method.

STATISTICAL THERMODYNAMICS

(4 credit hrs.)

History and review of classical thermodynamics; kinetic theory of an ideal monatomic gas; equations of state; statistical mechanics for systems of independent particles; concept of entropy; Maxwell, Boltzmann, Bose-Einstein and Fermi-Dirac statistics; partition function; velocity and energy distributions; classical-statistical comparisons; quantum mechanics; Schrodinger wave equation and applications; electronic states; the photon gas; the Einstein solid; diatomic and polyatomic gases; low temperature effects; statistical mechanics for systems of dependent particles; behaviour of real gases and liquids; irreversible processes; thermoelectric and thermochemical phenomena.

THEORY OF ELASTICITY

(4 credit hrs.)

Basic concepts: Notation; components of stress and strain; plane stress and plane strain; equations of equilibrium and compatability; Airy's stress function; applications to the solution of two-dimensional problems in rectangular co-ordinates; polar co-ordinates; stress distributions symmetrical about an axis; application to the solution of various problems.

Torsion: Prismatical bars, St. Venant's theory; membrane and other analogies; torsion of rectangular bars, angles, channels, etc.; hollow shafts and thin tubes.

Stress concentration: Mathematical and experimental methods; stress concentration in tension and compression members; stress concentration in torsion; circular shafts of variable diameter; stress concentration in bending; investigation of stress concentration with models; photoelastic method of stress measurements.

Thermal stresses: One-dimensional temperature distributions; rectangular plate, turbine blade; two-dimensional temperature distributions; circular disc, turbine disc; allowable stresses at elevated temperatures; creep, fatigue, thermal shock.

Stress waves: Longitudinal waves in prismatic bars; longitudinal impact of bars.

SYSTEMS ENGINEERING I

(3 credit hrs.)

Course dealing mainly with Stochastic Processes. Review of deterministic systems analysis. Random signal analysis. Correlation functions, probability functions and spectral densities

applied to signals. Analysis of linear systems subjected to random signals and noise. System identification and correlation analysis. Measurements of random signal parameters by analogue methods. Digital analysis applied to random signals and stochastic processes. Filtering.

SYSTEMS ENGINEERING II

(3 credit hrs.)

Course dealing with Optimization Techniques. Variational methods, performance optimization, Hamiltonean Theory, Pontrgagin's Maximum Principle, dynamic programming, linear programming, search techniques, simulation.

SYSTEMS ENGINEERING III

(3 credit hrs.)

Course dealing mainly with Control Systems. Review of classical control techniques. State space analysis of linear continuous and discrete systems. Non linear systems. Stability analysis. Optimal control. Identification and self adaptive control. Switching systems.

MASTER OF ENGINEERING SCIENCE (Electrical Engineering)

The Department of Electrical Engineering offers graduate subjects which may be taken as part of a graduate course leading to the degree of Master of Engineering Science in Electrical Engineering. The course may be completed in one year of full-time or two years of part-time study. The maximum period allowed for completion of the course is two years for full-time students and four years for part-time students.

The academic requirement for this degree is 42 credit hours (one credit hour is normally equal to one hour per week for one session). Not less than 24 credit hours must be accumulated from formal subjects. In addition to the formal course work, each student in the MEngSc course normally undertakes a research project carrying 18 credit hours. With the approval of the Head of Department the project may be replaced by graduate subjects.

Prospective students are advised that:—

(i) the approval of the Head of Department of Electrical Engineering for a particular programme of graduate subjects must be obtained in advance of registration;

(ii) not all electives will necessarily be available during a given year;

(iii) part-time candidates may be required to attend lectures on one half-day a week in addition to evenings;

(iv) up to 9 credits may be earned from subject(s) offered by another Department provided that the replacement is of equivalent duration and level and subject to the approval of the Head of Department of Electrical Engineering.

List of elective graduate subjects:—

	Credit Hours
Mathematical Methods in Electrical Eng I	3
Mathematical Methods in Electrical Eng II	3
Matrix Analysis of Electrical Machines	3
Static Convertors	3
Machines as Control System Elements	3
Advanced Power Systems I	3
Advanced Power Systems II	3
Control System Analysis	3
Optimal Control I	3
Nonlinear Control I	3
Control Systems with Discrete Time Data	3
High Voltage Properties of Materials & Techniques I	3
High Voltage Properties of Materials & Techniques II	3
Atmospheric Pollution Control Techniques	3
Switching Theory & Digital Electronics I	3
Control Computing I	3
Noise and Information Theory	3

DESCRIPTION OF SUBJECTS

MATHEMATICAL METHODS IN ELECTRICAL ENGINEERING I

Review of analysis and design problems arising in electrical engineering context. Mathematical modelling, problems in the analysis of signals circuits and systems.

Complex frequency and spectral analysis methods; properties and uses of Fourier, Laplace and Z transforms signal detection and processing, correlation functions.

MATHEMATICAL METHODS IN ELECTRICAL ENGINEERING II

Analysis in the time domain; linear and non-linear systems, continuous and discrete time, convolution and state-variable methods.

MATRIX ANALYSIS OF ELECTRICAL MACHINES

Mathematical models from coupled circuit viewpoint, direct solutions, properties and applications of transformations, solution methods for transformed equations, non ideal machines.

STATIC CONVERTORS

Rectifiers, invertors, pulse convertors; properties of thyristors; protection and control.

MACHINES AS CONTROL SYSTEM ELEMENTS

Implications of feeding a.c. and d.c. machines from static convertors; stability, transient performance, heating.

ADVANCED POWER SYSTEMS I

An advanced course on industrial and reticulation power systems dealing with topics such as load flow, faults, stability, economic evaluation, effects of load characteristics; application of computers.

ADVANCED POWER SYSTEMS II

An advanced course on high voltage power systems dealing with topics such as power system transients, insulation co-ordination, stability economic leading; D.C. transmission.

CONTROL SYSTEM ANALYSIS

A unified approach using "classical" and "modern" methods to treat the control problems of identification, representation and solution, stability, design and optimization.

OPTIMAL CONTROL I

Formulation of the problems. Methods of Solution including variational, dynamic programming, Pontryagin's Maximum Principle. Examples of time optimal, fuel optimal and other criteria.

NONLINEAR CONTROL I

Methods of analysis including numerical, series approximations, graphical, describing function. Stability of nonlinear systems using Lyapunov's methods and extensions and functional methods.

CONTROL SYSTEMS WITH DISCRETE TIME DATA

Topics related to the use of digital equipment in control systems. The analysis and synthesis of control systems using sampling techniques.

HIGH VOLTAGE PROPERTIES OF MATERIALS & TECHNIQUES I

Gaseous ionisation and decay. Electric breakdown of gases, Corona applications—particle charging and collection, electric strength of solid and liquid dielectrics.

HIGH VOLTAGE PROPERTIES OF MATERIALS & TECHNIQUES II

Breakdown of a vacuum. Generation of high voltages, measurement of high voltages, non-destructive dielectric test techniques, advanced applications of ionised gases.

ATMOSPHERIC POLLUTION CONTROL TECHNIQUES

Surface, dynamic, optical and adhesive properties of particulates, effect of particulates and gases on air quality, basic theory of particulate collection using electrostatic, inertial and gravitational forces, filtration and measurement methods.

SWITCHING THEORY AND DIGITAL ELECTRONICS I

Analysis and design of combinational and sequential circuits. Application to the design of digital computers, error detecting and correcting codes. Linear sequential feedback circuits.

CONTROL COMPUTING I

Fundamental principles of digital, analogue and hybrid computational methods for the solution of engineering problems. Operation of hybrid computers and interfacing techniques.

NOISE AND INFORMATON THEORY

Principles of coding, channel capacity, redundancy; application of information theory to engineering systems.

MASTER OF SCIENCE IN OPERATIONS RESEARCH

The Department of Mathematics offers a postgraduate course leading to the award of the degree of Master of Science in Operations Research. The course is designed to provide professional training at an advanced level for a techniques oriented specialist who will be using a large scale computer system to produce realistic industrial and management models.

Additionally to the formal course work the student will be required to carry out work on a substantial project either on mathematical methodology or computer modelling. There will be considerable emphasis throughout the course on the development and efficient utilization of Operations Research Software on large scale computers.

The course consists of lectures, seminars, computer laboratory work, case studies and a research thesis. The minimum period of registration before the award of the degree shall be one calendar year in the case of full-time students and two years for students taking the course on a part-time basis. Students for whom additional prerequisite or co-requisite courses have been prescribed must expect their course to exceed the minimum period. The maximum period allowed for completion of the course is two years for full-time students and four years for part-time students.

To qualify for the degree, students must satisfy the examiners in respect of their academic attainments and their skill and competence in relevant aspects of practical professional work.

COURSEWORK FOR MASTER OF SCIENCE IN OPERATIONS RESEARCH

Each subject is presented as a one session unit.

	Hours
Operations Research 1 (General)	6
Operations Research 2 (Advanced Deterministics)	6
Operations Research 3 (Advanced Probabilistic)	6
Operations Research 4 (Case Studies)	6
Computational Techniques 1	4
Computational Techniques 2	4

DESCRIPTION OF SUBJECTS

OPERATIONS RESEARCH 1 (GENERAL)

A general course in which Operations Research will be structured and classified in terms of basic mathematical techniques (linear programming, graph theory, Markov chains, etc.) as well as in terms of the management decisions (inventory control, allocation, competition, queueing, etc.).

OPERATIONS RESEARCH 2 (ADVANCED DETERMINISTICS)

This course together with Operations Research 3 will treat the basic mathematical techniques in considerable depth.

Linear models (linear programming, duality, complementarity, parametric linear programming, sensitivity analyses). Game theory. Transportation and assignment. Integer and mixed programming. Branch and bound. Classical optimisation techniques for convex functions. Kuhn Tucker theory. Multidimensional response surfaces. Non-linear and dynamic programming (quadratic, geometric). Graph theory, scheduling, sequencing, network analysis.

OPERATIONS RESEARCH 3 (ADVANCED PROBABILISTIC)

Stochastic mathematical programming and network models. Birth and death processes (branching, order statistics). Matrix methods for Markov chains. Renewal theory. Replacement policies. Queueing and inventory models. Discrete simulation. Stationary random processes, time series (spectral representation). Forecasting. Multivariate statistical analysis. Non-linear regression.

OPERATIONS RESEARCH 4 (CASE STUDIES)

Case histories with particular emphasis on local industries.

COMPUTATIONAL TECHNIQUES 1

High level programming languages such as SIMSCRIPT II. List processing. Information storage and retrieval. Comparison of Mathematical Programming packages for very large problems. Design of files and data banks for commercial information systems.

COMPUTATIONAL TECHNIQUES 2

Numerical analysis with particular reference to constrained and unconstrained optimisation techniques. Simulation of queueing and job shop scheduling systems. Design of discrete simulation experiments. Statistical packages. Inter-active programming.

DIPLOMA IN EDUCATION

The Diploma in Education is a professional course in education for graduates of this or another approved university who seek teacher qualifications. It also serves as an introduction to the research disciplines of education for those who will later pursue higher studies in the field. At present the course is for one year full-time, but it is anticipated that in the near future it will be available on a part-time basis over two years. The various subjects involve lectures, seminars, tutorials, individual assignments and group exercises. Demonstrations of teaching methods and practice teaching are provided in co-operation with the Wollongong College of Advanced Education and local schools.

COURSE OUTLINE

Except where shown, all subjects are single session subjects. Hours per week are indicated in brackets. The decision as to whether subjects are offered in first or second session is taken at enrolment time in the light of staff availability.

Education

Australian Education (2)
Educational Practice (2)
Educational Psychology (2)
Sociology of Education (2)
Philosophy and Theory of Education (2)
Seminars in both sessions (2)

Methods of Teaching

All method subjects are double subjects. Students must study two methods, occupying 6-8 hours weekly including demonstration lessons.

Selected Topics

Physical Education (double session subject) (1)
Communication Skills (2)
Health and Health Education (2)
Electives (4)

Supervised Teaching Practice

Eight weeks in term time. Two weeks of unsupervised teaching practice is also required. This is usually undertaken before the first session lectures begin, and students not on teachers' scholarship are advised to contact the Head of Department before February to make arrangements.

AUSTRALIAN EDUCATION

This subject seeks to lift student awareness of problems in Australian education above the level of opinion and limited personal experience, by presenting them in their historical and comparative setting. Various developments in secondary and

tertiary education are discussed, with a view to understanding the interplay of social, economic, political and ideological factors, and the need to subject them to more rigorous research.

TEXTBOOKS

Cowan, R. W. T. ed. *Education for Australians.* Cheshire, 1966.
Partridge, P. H. *Society, Schools and Progress in Australia.* Pergamon, 1968.
Report of the Committee Appointed to Survey Secondary Education in New South Wales (Wyndham Report). Sydney, Government Printer, 1957.

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Austin, A. G. *Australian Education 1788-1900.* Pitman, 1961.
Australian College of Education. *Teachers in Australia.* Cheshire, 1966.
Australian Institute of Political Science. *Tertiary Education in Australia.* A. & R., 1965.
Barcan, A. *A Short History of Education in New South Wales.* Martindale Press, 1965.
Bean, C. E. W. *Here, My Son.* A. & R., 1950.
Butts, R. F. *Assumptions Underlying Australian Education.* A.C.E.R., 1961.
Connell, W. F. *The Foundations of Secondary Education.* A.C.E.R., 1967.
Cramer, J. F. & Browne, G. S. *Contemporary Education.* Rev. ed., Harcourt Brace, 1965.
Fogarty, R. *Catholic Education in Australia, 1806-1950.* 2 vols. M.U.P., 1959.
Jackson, R. W. B. *Emergent Needs in Australian Education.* A.C.E.R., 1962.
Kandel, I. L. *Types of Administration.* A.C.E.R., 1938.
Karmel, P. H. *Some Economic Aspects of Education.* Cheshire, 1962.
McKeown, P. J. & Hone, B. W. eds. *The Independent School.* O.U.P., 1967.
Melbourne Studies in Education. M.U.P. *(annually since 1957).*
Portus, G. V. *Free, Compulsory and Secular—A Critical Estimate of Australian Education.* O.U.P., 1937.
Report of the Committee on the Future of Tertiary Education in Australia (the Martin Report). Canberra, Government Printer, 1965.
Sanders, C. ed. *Technical Education for Development.* Western Australia U.P., 1966.
Wheelright, E. L. ed. *Higher Education in Australia.* Cheshire, 1965.

SELECTED JOURNALS

The Australian Journal of Education. A.C.E.R.
The Australian University. Australian Vice-Chancellors' Committee.
The Forum of Education. Sydney Teachers' College.

EDUCATIONAL PRACTICE

An appreciation of guiding principles common to the teaching of secondary school children will be gained through study of preparation at course, topic and lesson levels and the utilisation of school and community resources; aspects of classroom control and discipline; individual and group techniques of teaching; and evaluation procedures including the construction and administration of tests and examinations.

REFERENCE BOOKS

Alcorn, M. D., Kinder, J. S. & Schunert, J. R. *Better Teaching in Secondary Schools.* Rev. ed. Holt, Rinehart & Winston, 1964.
Clark, L. H. & Starr, I. S. *Secondary School Teaching Methods.* Macmillan, 1959.

Connell, W. F. ed. *The Foundations of Education.* Novak, 1962.
Connell, W. F. *The Foundations of Secondary Education.* Rev. ed. A.C.E.R., 1967.
Dunn, S. S. *Measurement and Evaluation in the Secondary School.* A.C.E.R., 1967.
Grambs, J. D. et al. *Modern Methods in Secondary Education.* Rev. ed. Holt, Rinehart & Winston, 1958.
Lindrall, C. M. *Measuring Pupil Achievement and Aptitude.* Harcourt, Brace & World, N.Y., 1967.
Shuenheimer, H. P. *Good Schools.* National Press, Melbourne, 1970.

EDUCATIONAL PSYCHOLOGY

A study of psychology as it bears on the educational process, through a treatment of learning, motivation and the development of adult modes of thinking. Although attention is paid to cognitive development throughout the school years, the cognition of the adolescent is especially considered.

TEXTBOOKS

Ausubel, D. P. & Robinson, F. G. *An Introduction to Educational Psychology.* Holt, Rinehart & Winston, N.Y., 1969. *(And accompanying study guide.)*
Winter, G. D. & Nuus, E. M. *The Young Adult: Identity and Awareness.* Scott Foresman, Illinois, 1969.

REFERENCE BOOKS

Ausubel, D. P. *The Psychology of Meaningful Verbal Learning.* Grune & Stratton, N.Y., 1963.
Ausubel, D. P. *Educational Psychology: A Cognitive View.* Holt, N.Y., 1968.
Baller, W. R. & Charles, D. C. *The Psychology of Human Growth and Development.* Holt, N.Y., 1968.
Berlyne, D. E. *Structure and Direction of Thinking.* Wiley, N.Y., 1965.
Bernard, H. W. *Psychology of Learning and Teaching.* McGraw-Hill, N.Y., 1965.
Bruner, J. S. *The Process of Education.* Vintage Books, N.Y., 1961.
Elkind, D. & Flavell, J. H. eds. *Studies in Cognitive Development.* O.U.P., 1969.
Fantini, M. D. & Weinstein, G. *The Disadvantaged.* Harper & Row, N.Y., 1968.
Gordon, I. J. *Studying the Child in School.* Wiley, N.Y., 1966.
Hebb, D. O. *A Textbook of Psychology.* Chandler, San Francisco, 1966.
Kimbilly, J. D. ed. *Learning and the Educational Process.* Rand McNally, Chicago, 1965.
McCandles, B. R. *Children: Behaviour and Development.* Holt, N.Y., 1969.
McGinitie, W. & Ball, S. eds. *Readings in Psychological Foundations of Education.* McGraw-Hill, N.Y., 1968.
Messer, E. A. *Children, Psychology and the Teacher.* McGraw-Hill, London, 1967.
Smart, M. S. & Smart, R. C. *Children: Development and Relations.* Macmillan, N.Y., 1967.
Travers, R. M. W. *Essentials of Learning.* Macmillan, N.Y., 1967.
Vernon, P. E. *The Structure of Human Abilities.* Methuen, London, 1961.
Wattenberg, W. W. *The Adolescent Years.* Harcourt, Brace & World, N.Y., 1955.

SELECTED JOURNALS

British Journal of Educational Psychology.
Education Research.
Harvard Education Review.

SOCIOLOGY OF EDUCATION

The sociological aspects of education are studied with special reference to the school. The school is seen both as a unit in the social structure and as a social system in itself. Topics will be allocated within these two broad areas of study.

TEXTBOOKS

Ashley, B. J., Cohen, H. S. & Slatter, R. E. *An Introduction to the Sociology of Education.* Macmillan, London, 1969.
Banks, O. *The Sociology of Education.* Batsford, London, 1968.
Brookover, W. B. & Gottlieb, D. *A Sociology of Education.* American Book Co., N.Y., 1964.
Campbell, W. J. ed. *Scholars in Context.* Willis & Sons, 1970.
Corwin, R. A. *A Sociology of Education.* Appleton-Century-Crofts, N.Y., 1965.
Havighurst, R. J. & Neugarten, B. L. *Society and Education.* 3rd ed. Allyn & Bacon, 1967.
Highet, C. *The Art of Teaching.* Methuen, London, 1951.
Johnson, D. W. *The Social Psychology of Education.* Holt, Rinehart & Winston, N.Y., 1970.
Mannheim, K. & Stewart, W. A. C. *An Introduction to the Sociology of Education.* Routledge & Kegan Paul, London, 1962.
Musgrave, P. W. *The Sociology of Education.* Methuen, London, 1965.
Shipman, M. D. *The Sociology of the School.* Longmans, London, 1968.
Swift, D. F. *The Sociology of Education.* Routledge & Kegan Paul, London, 1969.
Waller, W. *The Sociology of Teaching.* Wiley, N.Y., 1965.

REFERENCE BOOKS

Brembeck, C. S. & Grandstaff, M. *Social Foundations of Education.* Wiley, N.Y., 1969.
Charters, W. W. & Gage, N. L. eds. *Readings in the Social Psychology of Education.* Allyn & Bacon, 1963.
Cosin, B. R. et al. *School and Society: A Sociological Reader.* Routledge & Kegan Paul, London, 1971.
Drabick, L. W. *Interpreting Education: A Sociological Approach.* Appleton-Century-Crofts, N.Y., 1971.
Getzels, J. W. "A Social Psychology of Education" in G. Lindzey & E. Aronson—*The Handbook of Social Psychology.* Vol. 5. Addison-Wesley, Mass., 1969.
Halsey, A. H., Floud, J. & Anderson, C. A. eds. *Education, Economy and Society.* The Free Press, N.Y., 1961.
Hansen, D. A. & Gerstl, J. E. eds. *On Education—Sociological Perspectives.* Wiley & Sons, N.Y., 1967. (A very excellent collection of six essays.)
Havighurst, R. J., Neugarten, B. L. & Falk, J. M. *Society and Education.* Allyn & Bacon, Boston, 1967.
Katz, F. & Brown, M. *Sociology of Education.* Macmillan, 1970.
Rose, P. I. ed. *The Study of Society.* Random House, N.Y., 1967.
Sexton, P. C. ed. *Readings on the School in Society.* Prentice-Hall.
Swift, D. F. ed. *Basic Readings in the Sociology of Education.* Routledge & Kegan Paul, London, 1970.

SELECTED JOURNALS

Sociology of Education. The American Sociological Assoc.
Sociometry. The American Sociological Assoc.
Journal of Personality and Social Psychology.

PHILOSOPHY AND THEORY OF EDUCATION

A study of the nature and scope of educational theory. By tracing the development of educational ideas in western culture, it is seen how the various disciplines of educational theory have emerged to cope with problems of value, knowledge and public education.

REFERENCE BOOKS

Archambault, R. D. ed. *Philosophical Analysis and Education.* Routledge, 1966.
Brown, L. M. *General Philosophy in Education.* McGraw-Hill, 1966.
Brubacher, J. S. *A History of the Problems of Education.* 2nd ed. McGraw-Hill, 1966.
Buber, M. *Between Man and Man.* Fontana, 1961.
Connell, W. F. et al. *The Foundations of Education.* Novak, 1962.
Curtis, S. J. & Boultwood, M. E. *A Short History of Educational Ideas.* 4th ed. University Tutorial Press, 1965.
Dewey, J. *Democracy and Education.* Macmillan, 1916.
Dewey, J. *The Child and the Curriculum and The School and Society.* Phoenix Books. Chicago U.P., 1956.
Jeffreys, M. V. C. *Glaucon.* Pitman, 1955.
Maritain, J. *Education at the Crossroads.* Yale U.P., 1961.
Morrish, I. *Disciplines of Education.* Allen & Unwin, 1967.
Nash, P. et al. eds. *The Educated Man.* Wiley, 1965.
N.S.S.E. 54th Yearbook. *Modern Philosophies and Education.* Chicago U.P., 1955.
Niblett, W. R. ed. *Moral Education in a Changing Society.* Faber, 1963.
Peters, R. S. *Ethics and Education.* Allen & Unwin, 1966.
Price, K. *Education and Philosophic Thought.* Allyn & Bacon, 1962.
Reid, L. A. *Philosophy and Education.* Heinemann, 1962.
Rusk, R. R. *The Doctrines of Great Educators.* 2nd ed. Macmillan, 1954.
Ulich, R. H. *History of Educational Thought.* American Book Co., 1945.
Wynne, J. P. *Theories of Education.* Harper, 1963.

SELECTED JOURNALS

Educational Theory. University of Illinois.
Educational Philosophy and Theory. Univ. of N.S.W.
Harvard Educational Review. Harvard University.

COMMERCE METHOD

The aim is to develop competent and critical teachers of economics and commerce. These subjects are discussed in relation to a general theory of education, problems of programming, lesson preparation and presentation.

REFERENCE BOOKS

Edwards, et al. *The Teaching of Economics.*
Fenton, E. *Teaching the New Social Studies in Secondary Schools.* Holt, Rinehart & Winston, 1967.
Hidy, W. & Canein, P. *Casebook in Business History and Economic Concepts for Use in Secondary Schools.* 1966.
Tonne, H. et al. *Methods of Teaching Business Subjects.*

SELECTED JOURNALS

American Economic Review. American Economic Association.
Economica. London School of Economics.
The Economic Record. The Economic Society of Australia and New Zealand.

ENGLISH METHOD

This course deals with the aspects of language, expression and literature that concern the teacher in the secondary school. Language work examines contemporary theories and practice and the changing nature of linguistic studies. Expression themes include the fostering of responsive writing and aims and methods in oral practice. In the examination of literature the need is stressed to foster enjoyment and understanding at various levels. Some attention is given to testing, the programming of work and the interpretation of curricula.

REFERENCE BOOKS

Goldstein, M. B. *The Teaching of Language in Our Schools.* Macmillan, 1966.

Hoffman, C. H. *Speech in the Australian Classroom.* Ure Smith, 1964.

Holbrook, D. *English for the Rejected.* Cambridge U.P., 1964.

Holbrook, D. *The Secret Places.* Methuen, 1965.

Schoenheimer, H. R. *Education Through English.* Cheshire, 1967.

Walsh, J. H. *Teaching English.* Heinemann, 1965.

Whitehead, F. W. *The Disappearing Dais.* Chatto & Windus, 1966.

SELECTED JOURNALS

English in Australia. Australian Association for the Teaching of English, Melbourne.

The Teaching of English. English Teachers' Association of N.S.W.

GEOGRAPHY METHOD

A survey of the principles and problems underlying the selection, organisation and presentation of geographical knowledge. Topics include: the place of geography in the secondary school, the nature and organisation of programmes, the inter-relationship of systematic and regional geography, and specific aspects of classroom practice and field studies.

REFERENCE BOOKS

Biddle, D. S. ed. *Readings in Geographical Education.* Whitcombe & Tombs, Sydney, 1968.

Chorley, R. J. & Haggett, P. eds. *Frontiers in Geographical Teaching.* Methuen, London, 1965.

Hartshorne, R. *Perspective on the Nature of Geography.* Rand-McNally, Chicago, 1959.

Long, M. & Roberson, B. S. *Teaching Geography.* Heinemann Educational Books, London, 1966.

UNESCO. *Source Book for Geography Teaching.* Longmans, Green and Co., London, 1965.

SELECTED JOURNALS

Australian Geographer. Geographical Society of N.S.W.

Geography. Geographical Association, London.

Journal for Geography. National Council for Geographic Education, Chicago.

HISTORY METHOD

Students are introduced to the theory and practice of the teaching of history at the secondary school level through a study of the principles and problems underlying the selection, organisation and presentation of historical information. Topics include the nature of history; the purposes behind its teaching; programming; practical aspects of classroom work.

REFERENCE BOOKS

Carr, E. H. *What is History?* Pelican, 1961.
Dance, E. H. *The Place of History in Secondary Teaching.* Harrap, 1970.
Dufty, D. G. *Teaching About Society.* Rigby, 1970.
Elton, G. R. *The Practice of History.* S.U.P., 1967.
Hancock, W. K. *Attempting History.* A.N.U., 1969.
Stretton, H. *The Political Sciences.* Routledge & Kegan Paul, 1969.
Thompson, D. *The Aims of History.* Thames & Hudson, 1969.
Walshe, R. & Little, N. eds. *Ways We Teach History.* History Teachers' Association, Sydney, 1970.

SELECTED JOURNALS

English-History Bulletin. N.S.W. Department of Education.
Teaching History. Journal of the N.S.W. History Teachers' Association.
Teaching Method Bulletin. N.S.W. History Teachers' Association.

MATHEMATICS METHODS

Mathematics First Method seeks to develop in students an awareness of various methods possible in secondary school. Emphasis is placed on the development of concepts, use of discovery and grading of material. Aims for different age and ability groups are related to these. Students doing another subject method as well will take this course.

Mathematics Second Method deals with a selection of these topics from an advanced standpoint, and is for students taking mathematics as a double method.

REFERENCE BOOKS

Allendoerfer, C. B. & Oalsley, C. O. *Principles of Mathematics.* McGraw-Hill, 1955.
Courant, R. & Robbins, H. *What is Mathematics?* 4th ed. O.U.P., 1961.
Howson, A. G. ed. *School Mathematics Project.* C.U.P., 1965.
Coxeter. *Introduction to Geometry.* Wiley, 1963.
Kline, M. *Mathematics: A Cultural Approach.* Addison-Wesley, 1962.
National Council of Teachers of Mathematics. *Computer-orientated Mathematics.* 1965.
Reeve. *Mathematics for the Secondary School.* Holt, Rinehart & Winston, 1960.
Schaaf, W. L. *Mathematics for Everyday Use.* Barnes & Noble, 1958.

SELECTED JOURNALS

Australian Mathematics Teacher.
Mathematics Teacher. National Council of Teachers of Mathematics.
N.S.W. Department of Education Mathematics Bulletin.

SCIENCE METHOD

Science First Method seeks to prepare graduates to teach at all high school levels, especially in the areas of physics, chemistry, biology and geology. Topics include: science in the school curriculum; aims, procedures and programme planning; teaching aids; pupils' records and assessment; safety precautions. Where previous studies have covered some areas inadequately, students may be required to gain additional content knowledge. Students doing another subject method as well will take this course.

Science Second Method deals with the above topics and others from an advanced standpoint, and is for students taking science as a double method.

REFERENCE BOOKS

A Biology Course for Teachers. Correspondence course prepared in the School of Biological Sciences, University of Sydney.

Dictionary of Geological Terms. Dolphin Reference Book, 1962.

Gilluly, J., Waters, A. C. & Woodford, A. O. *Principles of Geology.* 2nd ed. Freeman, 1959.

Hatch, F. H., Wells, A. K. & Wells, M. K. *Petrology of the Igneous Rocks.* 12th ed. Allen & Unwin, 1961.

Heller, R. L. ed. *Geology and Earth Science Sourcebook for Elementary and Secondary Schools.* American Geological Institute.

Holmes, A. *Principles of Physical Geology.* Nelson, 1960.

McDonald, Massey & Tebbutt. *Enquiring into the Earth.*

Meyer, G. R. ed. *Field Excursions in Biology for Fifth and Sixth Forms.* Dept. Education, N.S.W., In-service Training Branch, 1965.

Moody, P. A. *Introduction to Evolution.* Harper & Row, 1962.

Notes on Biology—Forms V and VI. Dept. Education, N.S.W., In-service Training Branch.

Nuclear Research Foundation. *Science for High School Students.* N.S.W. Government Printer, Sydney, 1964.

Nuclear Research Foundation. *Science for High School Students—a Teacher's Manual.* N.S.W. Government Printer, Sydney, 1964.

Nuclear Research Foundation. *Senior Science for High School Students.* Parts 1-3. N.S.W. Government Printer, Sydney, 1966.

Nusher, B. *The Geology Syllabus for Forms V and VI Teaching Notes.* Dept. Education, N.S.W., In-service Training Branch.

Read, H. H. *Rutley's Elements of Mineralogy.* Allen & Unwin, 1960.

Sinnotl, E. W., Dunn, L. C. & Dobzhansky, T. *Principles of Genetics.* McGraw-Hill, 1958.

UNESCO. *Sourcebook for Science Teaching.* UNESCO, 1962.

Villee, C. A. *Biology.* W. B. Saunders, 1962.

SELECTED JOURNALS

Australian Science Teachers' Journal. Australian Science Teachers' Association.

Science Education News. Science Teachers' Association of N.S.W.

SELECTED TOPICS

The selected topics are of two kinds: professional skills and academic electives.

(a) Lectures and exercises in certain professional skills given generally at the Wollongong College of Advanced Education include:

(i) *Physical Education.* The aim is to encourage personal physical fitness in the Diploma student, as well as to prepare him for the duties in this area that fall to the general teacher.

(ii) *Health and Health Education.* Students are given guidance concerning physical and mental health, and informed of resources available in the schools.

(iii) *Communication Skills.* Students are made more aware of problems of communication in the classroom, and their own personal competence is improved.

(b) *Electives.* Lectures and tutorials are offered in a variety of electives designed to provide opportunity for students to pursue some studies at greater depth. While the composition of the student group from year to year will partly determine which electives are offered, it is intended to provide a range representative of the main disciplines of education. Students are expected to choose electives that enable them to draw in some way on their previous studies.

SUPERVISED TEACHING PRACTICE

Students engage in the equivalent of eight weeks' full-time teaching practice in schools. They are expected to plan learning units, observe and take individual lessons, develop classroom routines and controls, test and evaluate pupil learnings, and become acquainted with the general school duties of a teacher. As the practice situation is meant to be the application in the field of principles studied and informal subjects already described, a detailed reference list is not appropriate, but a specific orientation to Teaching Practice is provided by the following books.

REFERENCE BOOKS

Cohen, A. & Garner, N. A. *A Student's Guide to Teaching Practice.* L.U.P., 1963.

Devor, J. W. *The Experience of Student Teaching.* Macmillan, 1964.

Student Teaching in Secondary Schools. 4th ed. McGraw-Hill, 1964.

Appendix

THE UNIVERSITY OF WOLLONGONG ACT 1972.

An Act to provide for the establishment and incorporation of a University at Wollongong; to constitute a Council of the University and define its powers, authorities, duties and functions; to vest certain property in the University; to dissolve the Wollongong University College; to amend the Superannuation Act, 1916, the Local Government Act, 1919, and certain other Acts in certain respects; and for purposes connected therewith. (Assented to, 30th November, 1972.)

BE it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of New South Wales in Parliament assembled, and by the authority of the same, as follows:—

PART I.

PRELIMINARY.

Short title and division of Act.

1. (1) This Act may be cited as the "University of Wollongong Act, 1972".

(2) This Act is divided as follows:—

Commencement.

2. (1) This section and sections 1 and 3 commence on the date of assent to this Act.

(2) Part II shall commence upon such day as may be appointed by the Governor in respect thereof and as may be notified by proclamation published in the Gazette.

(3) Part III shall commence upon such day as may be appointed by the Governor in respect thereof and as may be notified by proclamation published in the Gazette being a day that is later than the day appointed pursuant to subsection (2).

Interpretation.

3. In this Act, unless the context or subject-matter otherwise indicates or requires—

"by-laws" means by-laws made under this Act;

"Chancellor" means Chancellor of the University;

"College" means Wollongong University College established and maintained by The University of New South Wales under the provisions of the University of New South Wales Act, 1968;

"College Council" means Council of the College;

"Committee" means Selection Committee constituted under Part II;

"Council" means Council of the University;

"Deputy Chancellor" means Deputy Chancellor of the University;

"University" means The University of Wollongong;

"Vice-Chancellor" means Vice-Chancellor of the University.

PART II.

VICE-CHANCELLOR DESIGNATE.

Selection Committee.

4. (1) The Minister shall constitute a committee consisting of eight members to hold office until the commencement of Part III of whom—

(a) one shall, by reason of his being the holder of, or a person who was the holder of, the office of Vice-Chancellor of any University in Australia, be appointed by the Minister as Chairman of the Committee;

(b) one shall be appointed by reason of his being the Chairman of the New South Wales Universities Board or a member of that Board nominated by that Chairman to be appointed to the Committee;

(c) two shall be appointed by the Minister; and

(d) four shall be elected members.

(2) The elected members of the Committee shall be qualified as is prescribed by this subsection and shall comprise—

(a) a person who is a professor, and a person who is not a professor, both elected by and from the professors, associate professors, senior lecturers and lecturers of the full-time staff of the College, the Librarian, the Bursar, the Registrar and the Secretary of the College; and

(b) two persons elected by and from the members of the College Council, both being persons who are ineligible for election to the Committee pursuant to paragraph *(a)*.

(3) A casual vacancy occurs in the Committee where—

(a) in the case of the member referred to in subsection (1) *(b)*, that member ceases to be the Chairman of the New South Wales Universities Board, or where the member referred to in subsection (1) *(b)* is a member of the Board nominated by that Chairman, that member ceases to be a member of the Board;

(b) in the case of an elected member, that member ceases to hold the qualification by reason of which he was eligible for election to the Committee;

(c) a member dies;

(d) a member becomes a temporary patient or a continued treatment patient, a protected person or an incapable person within the meaning of the Mental Health Act, 1958, or a person under detention under Part VII of that Act;

(e) a member resigns his membership in writing under his hand addressed to the Minister; or

(f) for any reason the Minister deems fit, a member is removed by the Minister from office as a member of the Committee.

(4) A casual vacancy shall—

(a) in the case of an elected member, be filled by a person qualified and elected in accordance with subsection (2); and

(b) in any other case, be filled by a person qualified in accordance with subsection (1) *(a)*, *(b)* or *(c)* to fill the vacancy concerned.

(5) Meetings of the Committee shall be convened by the Chairman of the Committee.

(6) At any meeting of the Committee—

(a) six members shall form a quorum;

(b) a decision of the majority of the members present at the meeting shall be the decision of the Committee; and

(c) the Chairman, in the event of there being an equality of votes, may give a casting vote.

(7) Any act or proceeding of the Committee is, notwithstanding that at any time when the act or proceeding was done, taken or commenced there was—

(a) a vacancy in the office of the membership of the Committee; or

(b) any defect in the appointment, or any disqualification, of a member of the Committee,

as valid as if the vacancy, defect or disqualification did not exist and the Committee were fully and properly constituted.

(8) Any election for the purpose of electing the elected members of the Committee shall be conducted by the Registrar of The University of New South Wales at such time or times and in such manner as that Registrar deems fit.

Powers, duties and functions of Committee.

5. The Committee shall be charged with the power to select a person to be the Vice-Chancellor designate of the University and for that purpose shall—

(a) at a meeting convened as soon as practicable whenever the Minister notifies the Chairman that there is a vacancy in the office of Vice-Chancellor designate of the University, arrange to call for applications for that office to be made on or before a stated day;

(b) meet as soon as practicable after that stated day with a view to selecting a person to be the holder of that office;

(c) determine in consultation with the Council of The University of New South Wales and the College Council or, where either Council has appointed persons to be its representatives for the purpose, those persons, the terms upon which and conditions subject to which a person may, pursuant to section 6, continue or be appointed as a member of the full-time staff of the College and take office under section 20 (1) as Vice-Chancellor; and

(d) where a person is selected for appointment to that office, recommend the appointment to the Council of The University of New South Wales.

Appointment of Vice-Chancellor designate.

6. (1) Subject to subsection (2) the Council of The University of New South Wales shall, upon such terms and conditions as are determined pursuant to section 5 *(c)*, appoint the person recommended by the Committee pursuant to section 5 *(d)* as the Vice-Chancellor designate of the University who shall be a member of the full-time staff of the College.

(2) Notwithstanding the terms and conditions determined pursuant to section 5 *(c)*, where the person appointed under subsection (1) is, at the time of his appointment, a member of the full-time staff of The University of New South Wales, he shall not be appointed to the office of Vice-Chancellor designate of the University upon terms and conditions less favourable than those upon which he was employed immediately before that appointment.

Reference of certain matters to Minister.

7. (1) Where the Committee is unable to determine any matter the Chairman shall refer the matter to the Minister for resolution.

(2) Any decision of the Minister in respect of any matter referred to him under this section shall be as final and binding as if the decision were made by the Committee.

PART III.

THE UNIVERSITY OF WOLLONGONG.

Establishment of University.

8. A University, consisting of—

(a) a Council;

(b) Convocation;

(c) the professors and such other classes of persons giving instruction within the University as may be prescribed by the by-laws and such superior officers within the University as may be so prescribed; and

(d) the graduates and students of the University,

is hereby established at Wollongong in the State of New South Wales.

Incorporation of University.

9. (1) The University is a body corporate under the name of "The University of Wollongong".

(2) The common seal of the University shall be kept in such custody as the Council may direct and shall not be used except by resolution of the Council.

Functions of the University.

10. The functions of the University shall, within the limits of its resources and subject to this Act and the by-laws, include—

(a) the provision at Wollongong or elsewhere of educational facilities at university standard for any persons enrolled therein;

(b) the dissemination and increase of knowledge and the promotion of scholarship; and

(c) the conferring and awarding of degrees and diplomas.

Facilities to be provided for students.

11. The University may, for the purpose of discharging its functions, provide from time to time such facilities for its students as it deems desirable.

The Council.

12. (1) There shall be a Council of the University which, subject to subsection (3), shall have and may exercise and discharge the powers, authorities, duties and functions conferred and imposed upon the Council by or under this Act.

(2) The Council shall be the governing authority of the University.

(3) The provisions of sections 17, 18 and 19 do not apply to and in respect of the Council constituted under section 14.

Committees.

13. (1) The Council may by resolution appoint such committees as it thinks fit to assist and advise it in the carrying out of its functions and the exercise of its powers under this Act.

(2) A committee appointed under subsection (1) shall have, and may exercise and discharge, such powers, authorities, duties and functions as the Council may determine.

Constitution of first Council.

14. (1) The first Council shall consist of—

(a) the persons who immediately before the commencement of this Part held office as members of the College Council other than such members of that Council as, at that commencement, are members of the full-time staff of The University of New South Wales; and

(b) the person who, immediately before that commencement, held office, pursuant to section 6, as Vice-Chancellor designate of the University, unless he becomes a member of the Council pursuant to paragraph *(a)*.

(2) The members of the first Council shall, subject to this Act, hold office until the Council duly constituted under section 15 assumes office.

(3) Where a casual vacancy occurs in the office of any member of the first Council the Governor may appoint a person to the vacant office and the person so appointed shall hold office for the residue of his predecessor's term of office.

(4) The first meeting of the first Council shall be convened by the Vice-Chancellor who shall preside until a Chairman is elected pursuant to subsection (6).

(5) At any meeting of the first Council one-half (or where one-half is not a whole number the whole number next higher than one-half) of the total number of members for the time being of that Council, shall form a quorum.

(6) The members of the first Council shall, at their first meeting, elect from among their number a Chairman and Vice-Chairman.

(7) Subject to subsection (4), at every meeting of the first Council the Chairman or, if he is not present, the Vice-Chairman shall preside, but if both the Chairman and Vice-Chairman are not present, the members present shall elect a person from among their number to preside as Chairman.

(8) The first Council shall take all steps necessary to ensure so far as possible that a Council is duly constituted under section 15 so as to take office within six months after the commencement of this Part or within such extended time as the Governor may, by proclamation published in the Gazette at any time during that period of six months, specify.

Constitution of Council other than first Council.

15. (1) The Council, other than the first Council—

(a) shall be constituted in accordance with this section; and

(b) shall assume office upon such day as the Governor may appoint in that behalf and notify by proclamation published in the Gazette.

(2) The Council shall consist of—

(a) parliamentary members;

(b) official members;

(c) nominated members; and

(d) elected student and non-student members.

(3) The parliamentary members of the Council shall be—

(a) a member of the Legislative Council elected by that Council—

(i) as soon as practicable after the commencement of this Part and thereafter as soon as practicable after the commencement of the term of service of the members of that Council elected as required by section 17F (5) of the Constitution Act, 1902; or

(ii) where there is a casual vacancy in the office of a parliamentary member of the Council held pursuant to subparagraph (i), as soon as practicable after that office becomes vacant; and

(b) a member of the Legislative Assembly elected by that Assembly—

(i) as soon as practicable after the commencement of this Part and thereafter as soon as practicable after each general election of members of the Legislative Assembly; or

(ii) where there is a casual vacancy in an office of a parliamentary member of the Council held pursuant to subparagraph (i), as soon as practicable after that office becomes vacant.

(4) The official members of the Council shall be—

(a) the person for the time being holding the office of Chancellor, where he is not otherwise a member of the Council; and

(b) the person for the time being holding the office of Vice-Chancellor.

(5) The nominated members shall comprise four persons appointed by the Governor on the nomination of the Minister.

(6) The elected student members of the Council shall comprise two persons who are qualified and elected in each case as may be prescribed by the by-laws by and from persons who are enrolled as candidates proceeding to a degree or diploma in the University (other than persons so enrolled who are members of the full-time staff of the University).

(7) The elected non-student members of the Council shall be qualified and elected in each case or for each class as may be prescribed by this subsection and the by-laws and shall comprise—

(a) three persons, none of whom shall be a member of the full-time staff of the University, so elected by such of the members of Convocation as are included in a list prepared for the purposes of this subsection in accordance with the by-laws;

(b) four persons, of whom one shall not be, and each of the others shall be, a professor within the University, so elected by and from the professors and such other persons, being persons giving instruction within the University and superior officers within the University, as may be prescribed by the by-laws;

(c) one person, being a member of the staff of the University ineligible for election pursuant to paragraph *(b),* so elected by and from such members of the staff of the University as may be prescribed by the by-laws; and

(d) three persons so elected by the members of the Council for the time being referred to in subsections (3), (4), (5), (6) and paragraphs *(a), (b)* and *(c).*

(8) Where a person (not being a person who is a member of the Council) is appointed at any time by the Council to act in the place of the Vice-Chancellor, that person shall, while so acting, be deemed to be an official member of the Council.

(9) Subject to this Act, a member of the Council shall hold office—

(a) in the case of a parliamentary member, until a member of the House of Parliament that elected him is elected by that House to replace him;

(b) in the case of an official member, while he holds the office by virtue of which he is such a member;

(c) in the case of a nominated member, for such term not exceeding three years as may be prescribed by the by-laws; and

(d) in the case of an elected member, for such term not exceeding three years as may be prescribed by the by-laws.

(10) A retiring member of the Council shall not, by reason of that membership, be disqualified from again becoming a member of the Council.

(11) A casual vacancy shall—

(a) in the case of a nominated member, be filled by such person as the Governor may appoint; and

(b) in the case of an elected member, be filled by a person qualified in accordance with subsection (6) or (7) to be elected to the vacancy concerned in such manner as may be prescribed by the by-laws,

and any member filling a casual vacancy under this subsection shall hold office for the residue of his predecessor's term of office.

(12) A by-law for the purposes of subsection (6) or (7) may be made with respect to—

(a) all persons of a specified class; or

(b) all persons of a specified class other than persons of a specified class or classes.

(13) A by-law for the purposes of subsection (9) *(c)* and *(d)* may—

(a) prescribe a term of office by reference to determined, or determinable, days of commencement and termination;

(b) prescribe different terms of office in respect of the nominated members or the different classes of elected members; and

(c) provide for the retirement in rotation of the nominated members or the different classes of elected members.

Vacation of office.

16. A member of the Council shall be deemed to have vacated his office if he—

(a) dies;

(b) in the case of a nominated or elected member, transfers his place of permanent residence to a place that is not within the State or the Australian Capital Territory;

(c) declines to act;

(d) resigns his office by writing under his hand addressed—

(i) in the case of the parliamentary member who is a member of the Legislative Council, to the President of the Legislative Council;

(ii) in the case of the parliamentary member who is a member of the Legislative Assembly, to the Speaker of the Legislative Assembly;

(iii) in the case of a nominated member, to the Minister; or

(iv) in the case of an elected member, to the Vice-Chancellor;

(e) is a nominated or elected member who becomes bankrupt, applies to take the benefit of any law for the relief of bankrupt or insolvent debtors, compounds with his creditors or makes any assignment of his estate for their benefit;

(f) is a nominated or elected member who becomes a temporary patient or a continued treatment patient, a protected person or an incapable person within the meaning of the Mental Health Act, 1958, or a person under detention under Part VII of that Act;

(g) is a nominated member or elected member and absents himself from four consecutive meetings of the Council without leave of the Council;

(h) ceases, in the case of the parliamentary member elected by the Legislative Council, to be a member of the Legislative Council;

(i) ceases, in the case of the parliamentary member elected by the Legislative Assembly—

(i) to be a member of that Assembly otherwise than by reason of its dissolution or its expiration by effluxion of time; or

(ii) to be a member of that Assembly by reason of its dissolution or its expiration by effluxion of time and is not re-elected as a member of that Assembly at the next general election of members of that Assembly; or

(j) being an elected member referred to in section 15 (7) *(b)* or *(c)*, ceases to be an employee of the University.

Election of Chancellor.

17. (1) The Council shall, at its first meeting and whenever a vacancy in the office of Chancellor occurs, elect a person (whether a member of the Council or not) to be Chancellor of the University.

(2) The Chancellor shall hold office for such period not exceeding three years and on such terms and conditions as may be prescribed by the by-laws.

Deputy Chancellor.

18. (1) The Council shall, at its first meeting and whenever a vacancy in the office of Deputy Chancellor occurs, elect one of its members to be Deputy Chancellor of the University.

(2) The Deputy Chancellor shall, unless he sooner ceases to be a member of the Council, hold office for one year from the date of his election and on such conditions as may be prescribed by the by-laws.

(3) In the absence of the Chancellor or during a vacancy in the office of Chancellor or during the inability of the Chancellor to act, the Deputy Chancellor shall have and may exercise and discharge all the powers, authorities, duties and functions of the Chancellor.

Chairman.

19. (1) The Chancellor shall preside at all meetings of the Council and all committees constituted by the Council at which he is present.

(2) At any meeting of the Council or of a committee constituted by the Council at which the Chancellor is not present, the Deputy Chancellor shall preside, and in the absence of both the Chancellor and the Deputy Chancellor, a member elected by the members present from among their number, shall preside.

Appointment of Vice-Chancellor.

20. (1) The first Vice-Chancellor of the University shall be the person who, immediately before the commencement of this Part, was the member of the full-time staff of the College holding office as Vice-Chancellor designate pursuant to section 6 (1) and he shall, subject to this section, continue in office under the terms and conditions determined under section 5 (c) in relation to his tenure of the office of Vice-Chancellor.

(2) Whenever a vacancy occurs in the office of Vice-Chancellor, the Council shall appoint a person, whether a member of the Council or not, to be Vice-Chancellor.

(3) The Vice-Chancellor (other than the first Vice-Chancellor) shall hold office for such period and on such terms and conditions as the Council determines.

(4) The Vice-Chancellor shall be the chief executive officer of the University and shall have and may exercise and discharge such powers, authorities, duties and functions as may be prescribed by the by-laws and, subject to the by-laws, as the Council determines.

Quorum.

21. At any meeting of the Council one-half (or where one-half is not a whole number the whole number next higher than one-half) of the total number of members for the time being of the Council, shall form a quorum.

Re-appointment or re-election.

22. Nothing contained in this Act shall prevent any person from being immediately, or at any time, re-appointed or re-elected to any office or place under this Act if he is eligible and otherwise qualified, for the time being, to hold that office or place.

Validity of acts and proceedings.

23. (1) No act or proceeding of the Council or any committee of the Council, or of the Vice-Chancellor or any other person acting pursuant to any direction of the Council, shall be invali-

dated or prejudiced by reason only of the fact that at the time when such act or proceeding was done, taken or commenced there was a vacancy or a number of vacancies in the office or offices of any member or members of the Council.

(2) All acts and proceedings of the Council or any committee of the Council, or of the Vice-Chancellor or any other person acting pursuant to any direction of the Council, shall, notwithstanding the subsequent discovery of any defect in the appointment or election of any member of the Council or that any such member was disqualified from acting as or incapable of being a member of the Council, be as valid as if that member had been duly appointed or elected and was qualified to act as or capable of being a member and had acted as a member of the Council and as if the Council had been properly and fully constituted.

Public Service Act not to apply.

24. The provisions of the Public Service Act, 1902, do not apply to and in respect of the appointment of any member of the Council, and a member shall not, as such a member, be subject to the provisions of that Act.

Powers of Council.

25. (1) Subject to this Act and the by-laws, the Council—

(a) may provide such courses as it deems fit and in conferring and awarding degrees and diplomas issue such certificates in the nature of degrees, diplomas or otherwise as it thinks fit;

(b) may appoint and terminate the appointment of academic and other staff of the University;

(c) shall have the control and management of the affairs and concerns of the University and may act in all matters concerning the University in such manner as appears to it best calculated to promote the objects and interests of the University;

(d) may acquire by gift, bequest or devise any property for the purposes of this Act and may agree to carry out the conditions of any such gift, bequest or devise;

(e) may borrow money for the purpose of carrying out and performing any of its powers, authorities, duties and functions, for the renewal of loans or the discharge or partial discharge of any indebtedness to the Treasurer or to any bank within such limits, to such extent and upon such conditions as to security or otherwise as the Governor upon the recommendation of the Treasurer may approve;

(f) may invest any funds belonging to or vested in the University in any manner for the time being authorised for the investment of trust funds or in any manner

approved by the Governor, generally or in any particular case or class of cases, upon the recommendation of the Treasurer; and

(g) shall have the control and management of all real and personal property at any time vested in or acquired by the University, and may, subject to subsection (2), dispose of real or personal property in the name and on behalf of the University.

(2) Except as provided in subsection (3) the Council shall not, except with the approval of the Governor, alienate, mortgage, charge or demise any lands of the University.

(3) The Council may, without the approval of the Governor, lease any lands of the University where—

(a) the term of the lease does not exceed twenty-one years; and

(b) subject to subsection (4) (b), there is reserved for the whole of the term, the highest rent that can reasonably be obtained without fine.

(4) In the case of a lease of any lands of the University or any renewal thereof to a residential college affiliated with the University, the lease shall—

(a) be for a term not exceeding ninety-nine years;

(b) be at a nominal rent; and

(c) contain such other conditions as the University deems fit including a condition that the lease shall not be assigned.

(5) The rule of law against remoteness of vesting does not apply to and in respect of any condition of a gift, bequest or devise to which the University has agreed.

Delegation by Council.

26. (1) The Council may, in relation to any matter or class of matters, or in relation to any activity or function of the University, by resolution, delegate all or any of its powers, authorities, duties and functions under this Act (except this power of delegation) to any member or to any committee of its members, or to any officer or officers of the University.

(2) Every delegation under this section shall be revocable by resolution of the Council, and no delegation shall prevent the exercise of any power, authority, duty or function by the Council.

By-laws.

27. (1) The Council may make by-laws, not inconsistent with this Act, with respect to all matters pertaining to the University.

(2) Without prejudice to the generality of subsection (1) the Council may make by-laws for or with respect to—

(a) the management, good government, and discipline of the University;

(b) the method of election of members of the Council (other than the parliamentary members who are to be elected;

(c) the manner and time of convening, holding and adjourning the meetings of the Council and the manner of voting at such meetings, including postal voting or voting by proxy; the powers and duties of the Chairman thereof; the conduct and record of the business; the appointment of committees of the Council, and the quorum, powers and duties of such committees;

(d) the number, stipend, manner of appointment and dismissal of deans, professors, lecturers, examiners and other officers and employees of the University;

(e) the entrance standards for students;

(f) the fees and charges to be paid including fees and charges for entrance, tuition, lectures, residence and conferring of degrees and diplomas, and the exemption from, or deferment of, payment of fees and charges;

(g) the course of lectures or studies for, the examinations for, and the granting of, degrees, diplomas, certificates and honours and the attendance of candidates therefor;

(h) the examinations for, and the granting of, fellowships, scholarships, exhibitions, bursaries and prizes;

(i) the admission of students of other universities and institutions of higher education to any status within the University or the granting to graduates of such universities or institutions, or other persons, of a degree or diploma without examination;

(j) the establishment of residential colleges and halls of residence within the University and their conduct or the affiliation of residential colleges;

(k) the affiliation with the University of any educational or research establishment;

(l) the provision of a scheme of superannuation for the professors of the University; and

(m) the form and use of academic costume.

(3) Every by-law made by the Council shall be sealed with the common seal of the University and shall be submitted for the approval of the Governor.

Regulations, rules or orders.

28. (1) The by-laws may provide for empowering any authority (including the Council) or officer of the University to make regulations, rules or orders (not inconsistent with this Act or with any by-law) for regulating, or providing for the regulation of, any specified matter (being a matter with respect to which by-laws may be made) or for carrying out or giving effect to the by-laws.

(2) Any regulation, rule or order referred to in subsection (1)—

(a) shall have the same force and effect as a by-law;

(b) may, from time to time as the occasion requires, be amended or repealed by any authority (including the Council) or officer of the University empowered by subsection (1) to make such a regulation, rule or order; and

(c) shall be deemed not to be within the meaning of the term "regulation" as defined in section 41 of the Interpretation Act, 1897.

Convocation.

29. (1) Convocation shall consist of—

(a) all members and past members of the Council;

(b) all graduates of the University;

(c) all members of the full-time academic staff of the University and such other members or classes of members of the staff of the University as the by-laws may prescribe;

(d) such graduates of other universities, or other persons, as are, in accordance with the by-laws, admitted as members of Convocation; and

(e) without prejudice to the generality of paragraph (d), graduates of The University of New South Wales who spent at least three years as properly enrolled students of the College.

(2) The first meeting of Convocation shall be convened by the Vice-Chancellor.

(3) Meetings of Convocation shall be convened and the business at such meetings shall, subject to the by-laws, be as determined by Convocation.

(4) A quorum at any meeting of Convocation shall be such number of members as may be prescribed by the by-laws.

(5) Convocation shall have and may exercise and discharge such powers, authorities, duties and functions as may be prescribed by the by-laws.

(6) The Council may establish a Standing Committee and such other committees of Convocation as it considers necessary.

Treasurer to meet certain costs.

30. (1) There shall be paid to the University in respect of the year commencing upon the first day of January of the year of commencement of this Part and in respect of each succeeding year, such sum as the Treasurer may, upon taking into consideration the University's estimated expenditure requirements and income from all sources which is capable of being applied towards meeting such expenditure requirements, determine.

(2) To enable the Treasurer to exercise and perform the powers and functions conferred upon him by subsection (1) the University shall, in respect of the year commencing upon the first

day of January that next preceded the commencement of this Part, as soon as practicable after that commencement, and in respect of each succeeding year either before or as soon as practicable after its commencement, submit to the Treasurer estimates of the expenditure and income of the University for that year and such other information as the Treasurer may deem necessary.

(3) Any moneys payable by the Treasurer under this section shall be paid out of moneys provided by Parliament.

Advance by Treasurer.

31. The Treasurer may for the temporary accommodation of the University advance such moneys to the Council as the Governor may approve upon such terms and conditions as to repayment and interest as may be agreed upon.

Accounts to be rendered

32. The Council shall cause to be kept proper books of account in relation to the funds of the University and shall, as soon as practicable after the thirty-first day of December in each year, prepare and transmit to the Minister for presentation to Parliament a statement of accounts in a form approved by the Auditor-General exhibiting a true and correct view of the financial position and transactions of the University for the year.

Audit.

33. (1) The accounts of the University shall be audited by the Auditor-General who shall, in respect thereof, have all the powers conferred on the Auditor-General by any law for the time being in force relating to the audit of public accounts.

(2) The provisions of the Audit Act, 1902, apply to and in respect of the members of the Council and to the officers and employees of the University in the same manner as they apply to accounting officers of public departments.

Report of proceedings.

34. (1) As soon as practicable after the first day of January in each year, the Council shall prepare and furnish to the Minister a report upon the proceedings of the University during the period of twelve months immediately preceding that day including a summary of the work, researches and investigations carried out by the University during that period.

(2) A copy of each report under subsection (1) shall be laid before both Houses of Parliament as soon as practicable after it has been received by the Minister.

No religious test or political discrimination.

35. A person shall not, by reason of his religious or political views or beliefs, be denied admission as a student of the University or be ineligible to hold office therein or to graduate thereat or to enjoy any benefit, advantage or privilege thereof.

Visitor.

36. The Governor of New South Wales shall be the Visitor of the University with full authority and jurisdiction to do all such things and entertain such causes as may pertain to or be exercised by visitors as often as he thinks fit.

Teachers' college students and school teachers.

37. (1) The Council shall allow such persons as are—

(a) students of teachers' colleges established under the Public Instruction Act of 1880, teachers in schools established under that Act or members of the Public Service of New South Wales approved by the Minister;

(b) qualified in such manner as may be prescribed by the by-laws to be enrolled as students of the University;

(c) selected by the University for admission to the University; and

(d) not otherwise excluded from the University,

to attend University lectures for the purpose of proceeding to a first degree and to receive tuition for the period required for admission to that degree without payment of lecture, class or tuition fees.

(2) Nothing in subsection (1) shall exempt any person referred to in that subsection from the payment of such fees, other than lecture, class or tuition fees, as may be approved by the Council.

Provisions relating to Wollongong University College.

38. (1) The College is hereby dissolved.

(2) All real and personal property which immediately before the commencement of this Part was held by or was vested in The University of New South Wales or any other body in trust for, or on behalf of, the College shall, by virtue of this Act, be divested from The University of New South Wales or such other body and shall vest in the University to be applied by the University, subject to any trusts or conditions on which it was held immediately before that commencement, for the objects and purposes for which the University is established.

Transfer by University of New South Wales of certain property to University.

39. (1) This section applies to and in respect of real and personal property, including real and personal property vested in the University pursuant to section 38 (2), which immediately before the commencement of this Part was held by or was vested in The University of New South Wales and used by that University for the purposes of the College.

(2) The Minister shall cause to be constituted a Joint Committee consisting of five members of whom—

(a) one shall be the Auditor-General, or such person as he may nominate, who shall be Chairman and who shall convene, and preside at, all meetings of that Committee;

(b) two shall be such persons as are selected by the Council of The University of New South Wales to be representatives of that University; and

(c) two shall be such persons as are selected by the Council to be representatives of the University.

(3) The function of the Joint Committee is to determine as soon as practicable—

(a) what property to which this section applies (other than property vested pursuant to section 38) is to be transferred to the University;

(b) what debts and liabilities in respect of property to which this section applies are to be transferred to the University;

(c) the manner in which payments on account of leave or upon the retirement or death of a member of the staff of The University of New South Wales who is transferred to the University pursuant to this Act are to be met and the extent to which those payments should be apportioned between The University of New South Wales and the University;

(d) what books, documents, records and papers are to be handed over to the University; and

(e) such other matters relating to the matters referred to in paragraphs (a), (b), (c) and (d) as that committee deems necessary or expedient.

(4) Where a difference of opinion arises between the members of the Joint Committee representing The University of New South Wales and the University in respect of a determination of any of the matters referred to in subsection (3) the matter shall be determined in such manner as the Auditor-General or the person nominated by him to represent him on that Committee directs.

(5) Any determination made by the Joint Committee pursuant to subsection (3) shall have effect according to its tenor.

(6) The Chairman of the Joint Committee shall forward or cause to be forwarded to the Minister, The University of New South Wales and the University written notice of any determination it may make with respect to the matters referred to in subsection (3) and each University shall keep a record of that notice.

(7) Upon the receipt of a notice of any determination made by the Joint Committee, The University of New South Wales shall, as soon as practicable, thereafter give effect to the determination.

Persons holding office in the College.

40. (1) In this section a reference to an "officer of the College" is a reference to a person who, immediately before the commencement of this Part, held any salaried office or employment at the College otherwise than as

(a) a part-time lecturer, tutor or demonstrator;

(b) a temporary senior lecturer, lecturer, senior tutor, tutor, senior demonstrator or demonstrator; or

(c) a staff member employed on a fixed term contract.

(2) Every officer of the College shall become, at the commencement of this Part, an officer and an employee of the University on such terms and conditions (including terms and conditions as to remuneration and duration of appointment), not less favourable than those upon which he was employed at the College immediately before that commencement, as the Council determines.

(3) The Council may, in determining terms and conditions in respect of the title, duties or status attaching to offices or employment at the University, determine in relation to an officer of the College terms and conditions less favourable than those on which the officer of the College was employed immediately before the commencement of this Part.

(4) An officer of the College shall not have any right to damages or compensation in respect of the termination, in consequence of the commencement of this Part, of his tenure of any office or employment at the College but he shall be entitled to enforce or enjoy any right or privilege to which he was, by virtue of section 2 of the University of New South Wales Act, 1968, entitled immediately before that commencement as if the right or privilege had been conferred by this Act.

Amendments.

41. An Act specified in the first column of the Schedule is amended to the extent specified opposite that Act in the second column of the Schedule.

Sec. 41.

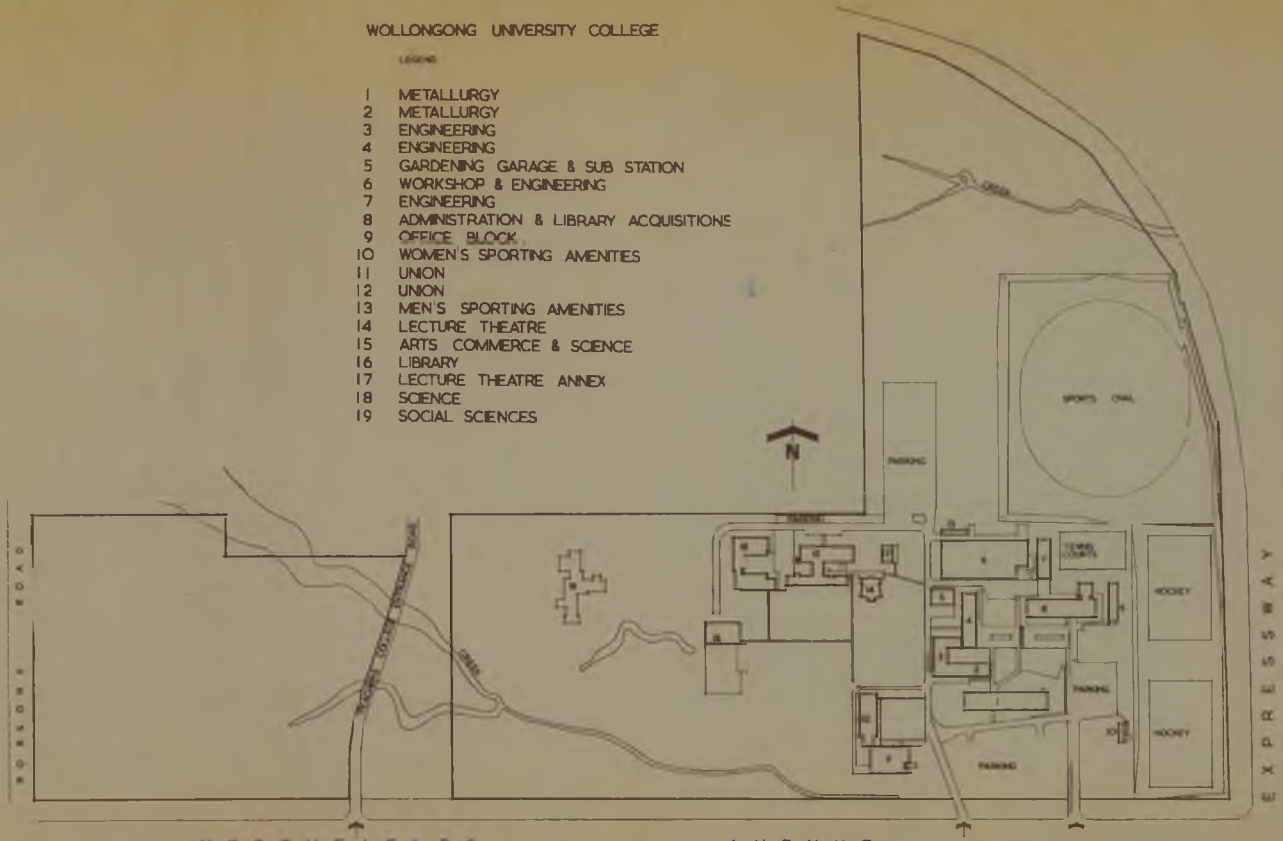
SCHEDULE.

First Column.		Second Column.
Year and No. of Act.	Short title.	Extent of amendment.
1916, No. 28.	Superannuation Act, 1916.	Insert in the definition of "Employee" in section 3 (1) after the words "University of New South Wales," the words "or, subject to subsection (5), a professor of The University of Wollongong,". Insert next after section 3 (4) the following new subsection:— (5) (a) Subject to this subsection the exclusion from the definition of "Employee" of a professor of The University of Wollongong shall not extend to a person whose rights as a contributor are continued by section 40 of the University of Wollongong Act, 1972. (b) A professor of The University of Wollongong shall cease to be a contributor if, after the commencement of Part III of the University of Wollongong Act, 1972, he becomes, or continues to be, party to any scheme or arrangement to which that University is also a party and under which he is or may become entitled to any pension or annuity or retiring allowance upon retirement from his professorship. (c) The provisions of subsection (3) shall apply, mutatis mutandis, to professors of The University of Wollongong other than those who are employees by virtue of paragraph (a). Insert at the end of Schedule III the following words:— The University of Wollongong.
1919, No. 41.	Local Government Act, 1919.	Insert next after section 132 (1) (fiv) the following new paragraph:— (fv) land which is vested in The University of Wollongong or in a college thereof and is used or occupied by the University or college, as the case may be, solely for the purposes thereof; and
1924, No. 50.	Metropolitan Water, Sewerage, and Drainage Act, 1924.	Insert next after section 88 (1) (f2) the following new paragraph:— (f3) land which is vested in The University of Wollongong or in a college thereof and is used or occupied by the University or college, as the case may be, solely for the purposes thereof.

WOLLONGONG UNIVERSITY COLLEGE

LEGEND

1 METALLURGY
2 METALLURGY
3 ENGINEERING
4 ENGINEERING
5 GARDENING GARAGE & SUB STATION
6 WORKSHOP & ENGINEERING
7 ENGINEERING
8 ADMINISTRATION & LIBRARY ACQUISITIONS
9 OFFICE BLOCK
10 WOMEN'S SPORTING AMENITIES
11 UNION
12 UNION
13 MEN'S SPORTING AMENITIES
14 LECTURE THEATRE
15 ARTS COMMERCE & SCIENCE
16 LIBRARY
17 LECTURE THEATRE ANNEX
18 SCIENCE
19 SOCIAL SCIENCES



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WOLLONGONG UNIVERSITY COLLEGE

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